

KIC 004271930

Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
004271930-01	OBS	No	0.892957	131.796601	33.8	3.268	10.9	8.4	1.73	8605	1.17	31841.11
004271930-02	OBS	No	1.287207	132.731536	51.2	6.278	10.1	10.8	1.73	8605	1.26	19553.81
004271930-03	OBS	No	0.595341	132.066106	64.4	2.806	9.1	10.6	1.73	8605	1.61	54669.06
004271930-04	OBS	No	26.289359	153.789839	465.2	3.389	7.9	11.6	1.73	8605	4.24	350.26

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004271930-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
004271930-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT
004271930-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT
004271930-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

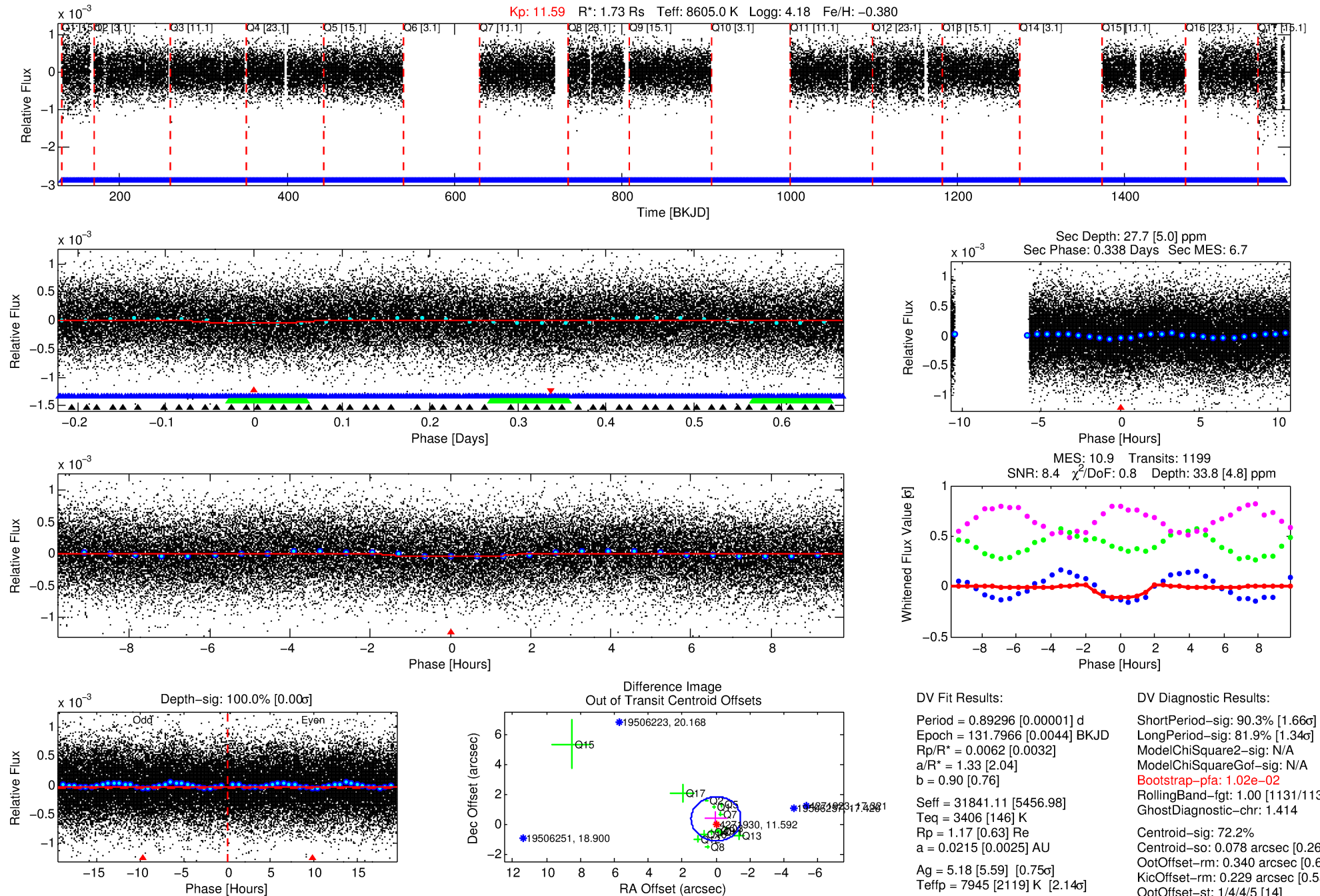
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004271930-01

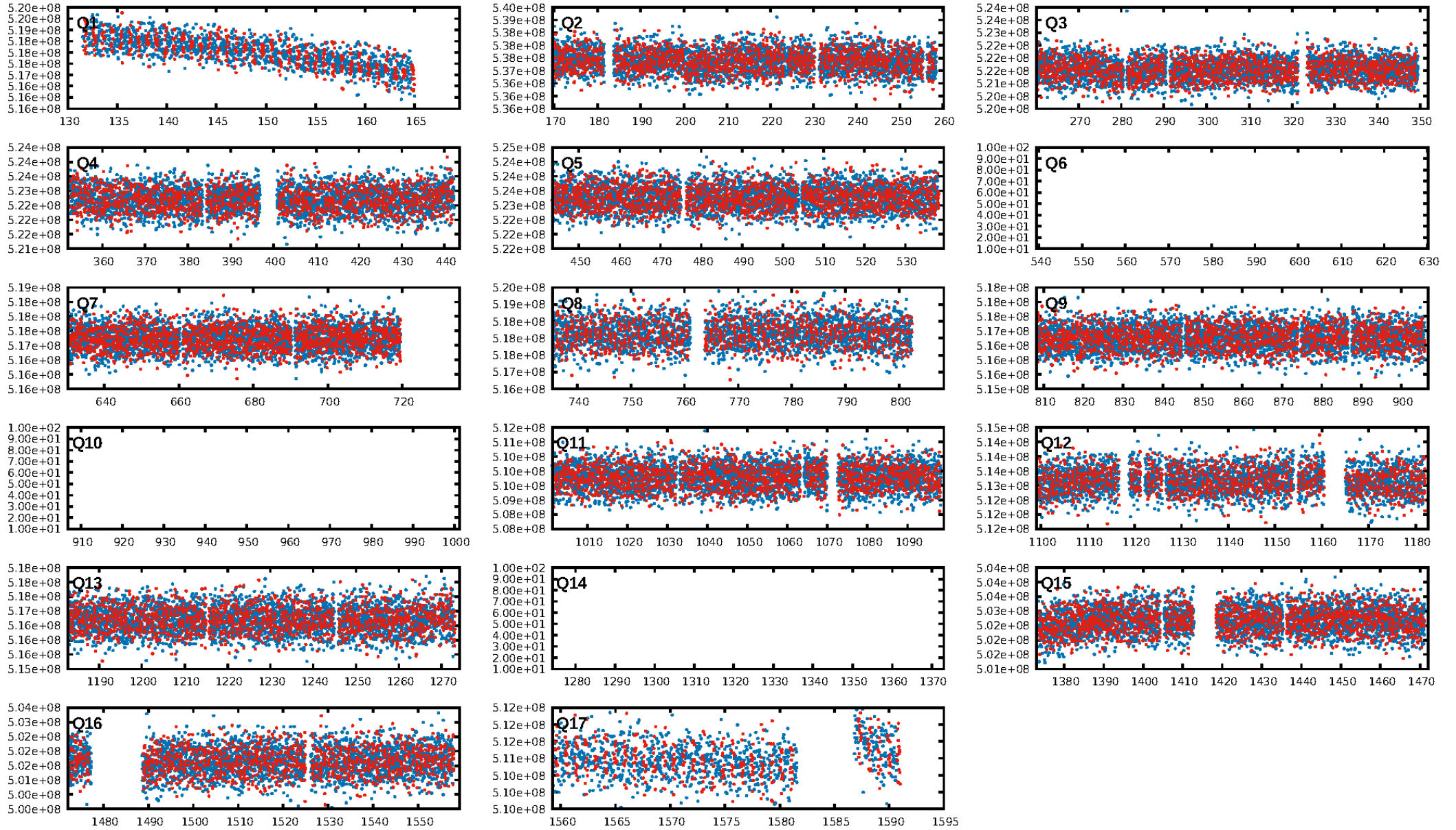
No Significant Match Found

DV One-Page Summary

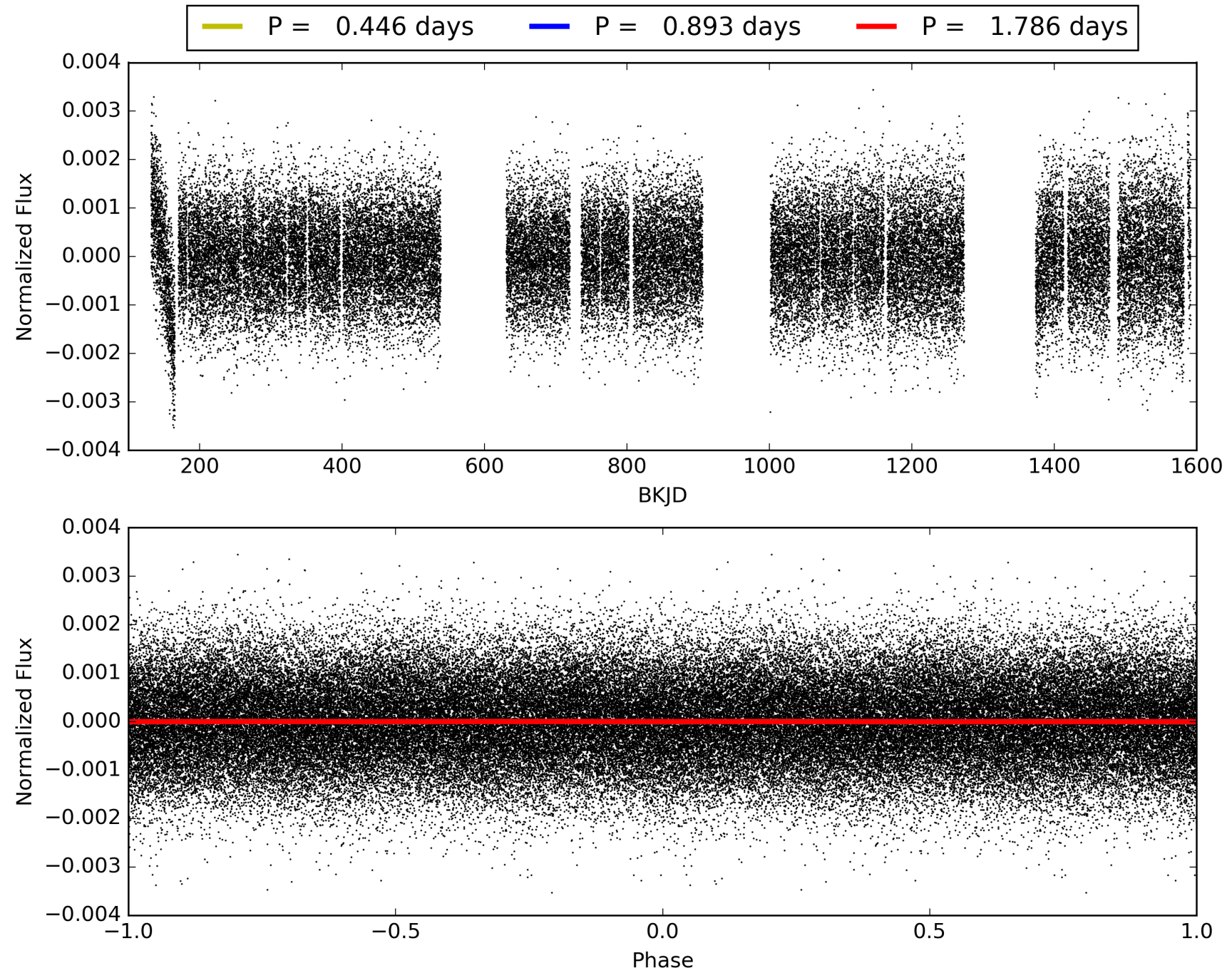
KIC: 4271930 Candidate: 1 of 4 Period: 0.893 d



TCE 004271930-01, PDC Light Curves

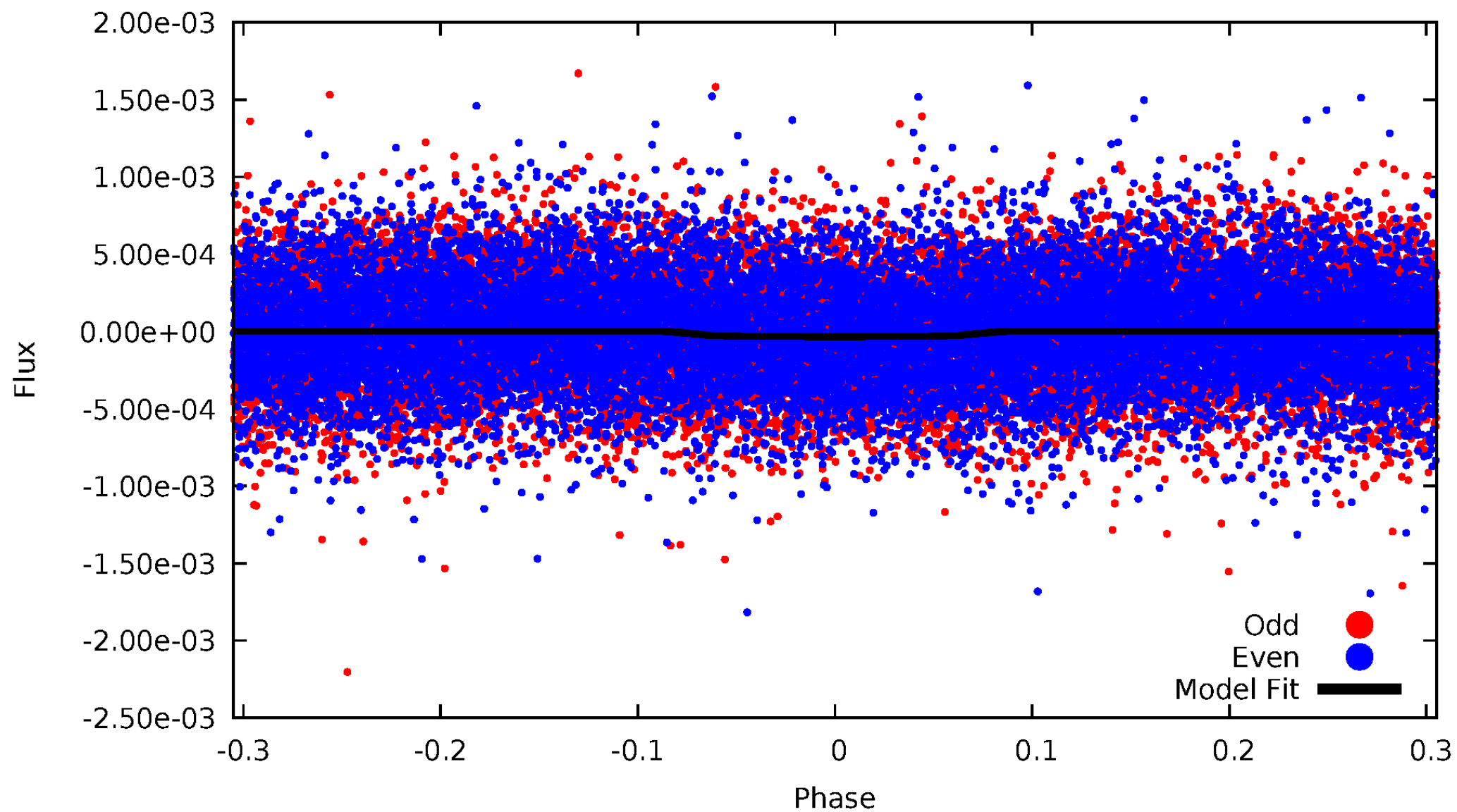


TCE 004271930-01



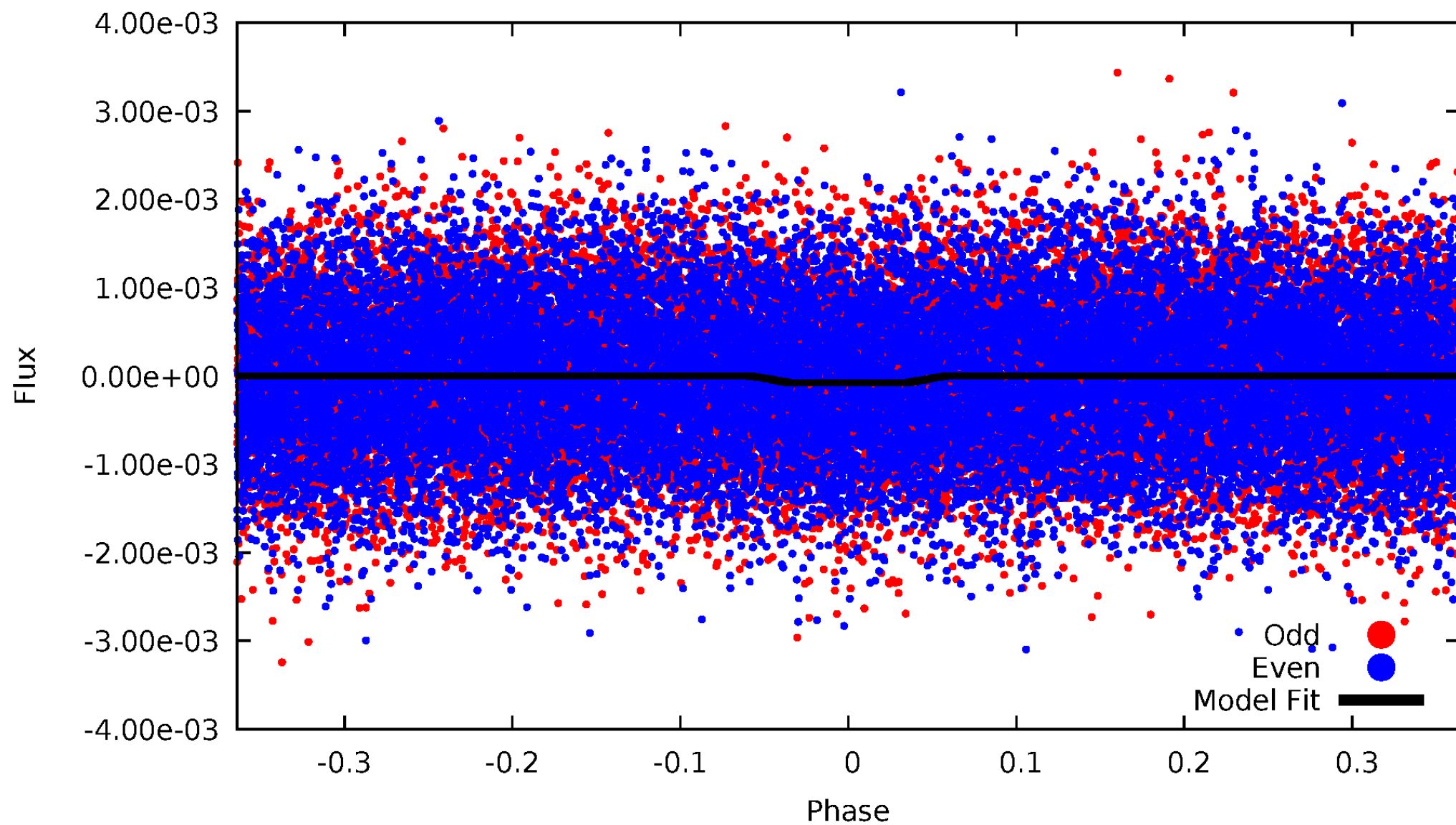
DV Odd/Even

TCE 004271930-01

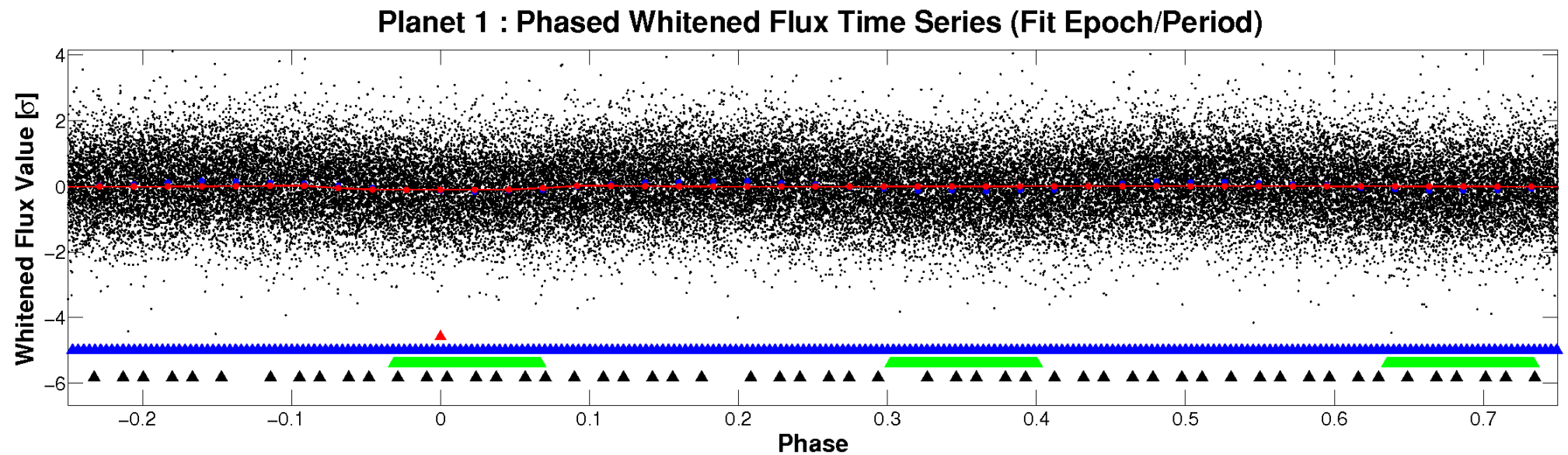
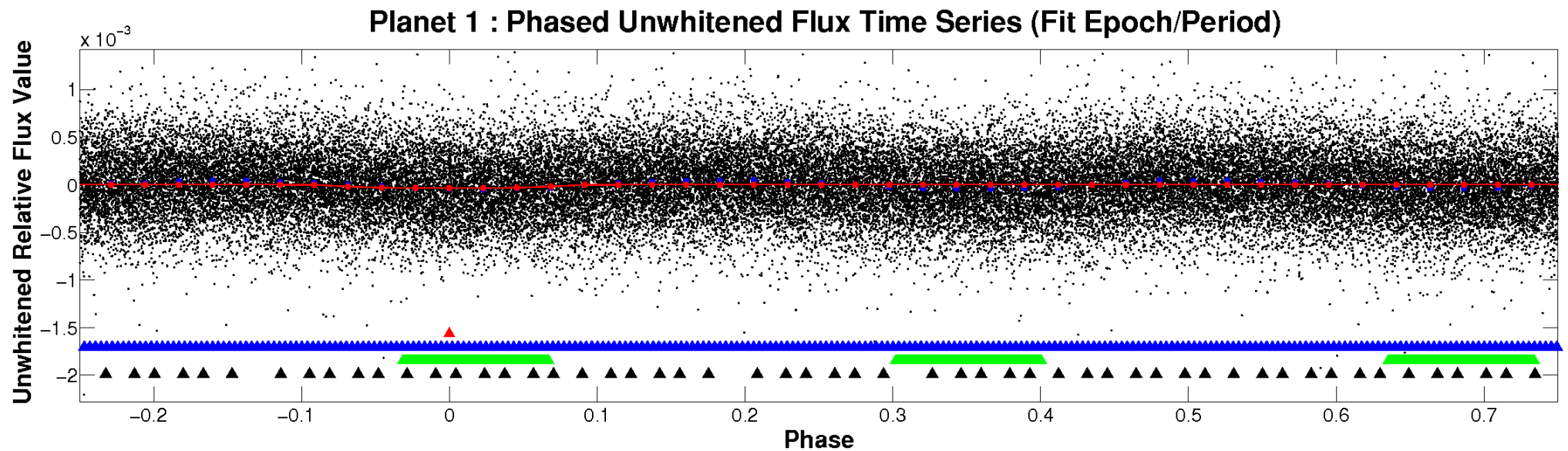


ALT Odd/Even

TCE 004271930-01

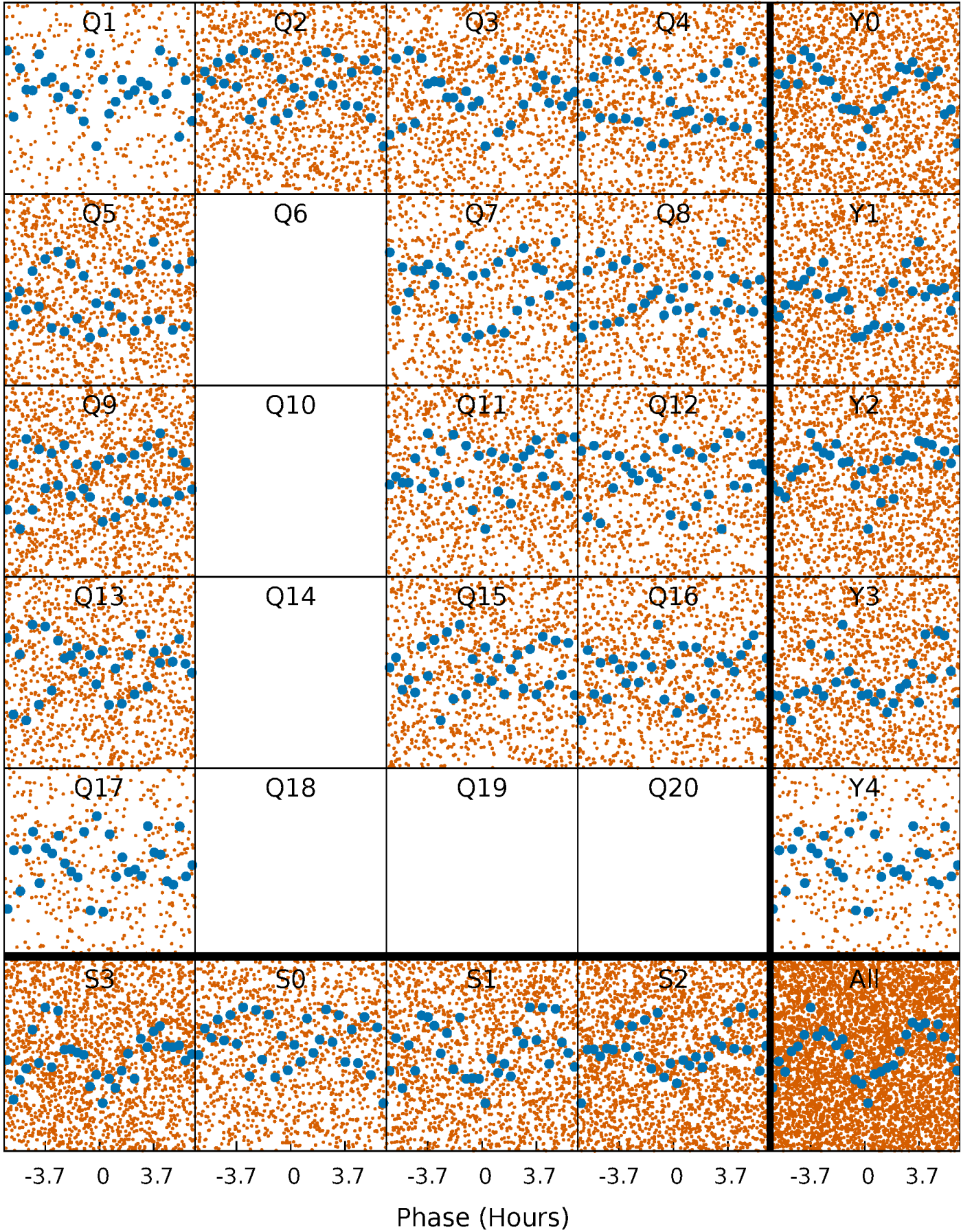


Non-Whitened Vs. Whitened Light Curve



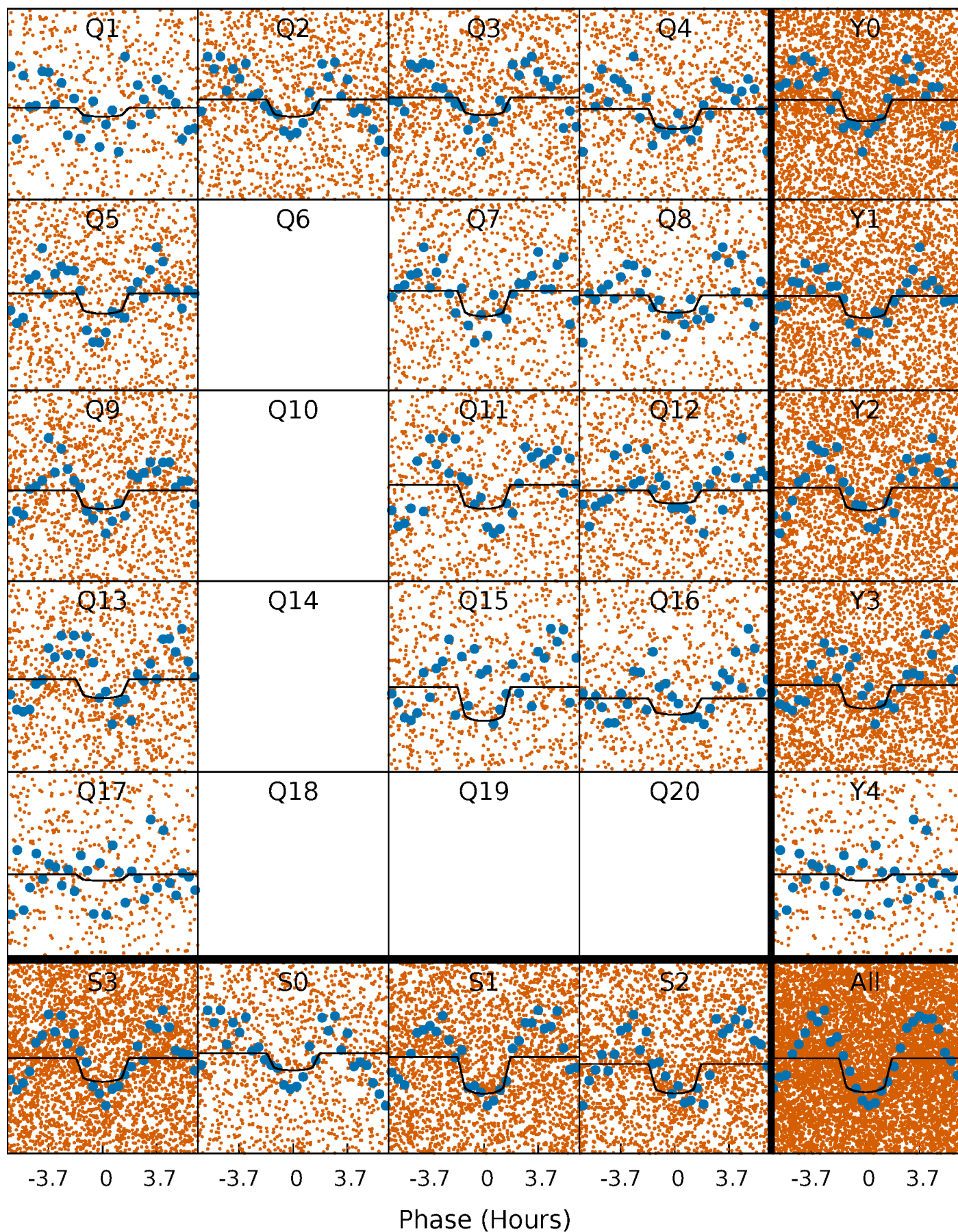
PDC Quarter-Phased Transit Curves

TCE 004271930-01 P= 0.892957 Days $T_0=131.796601$ (BKJD)



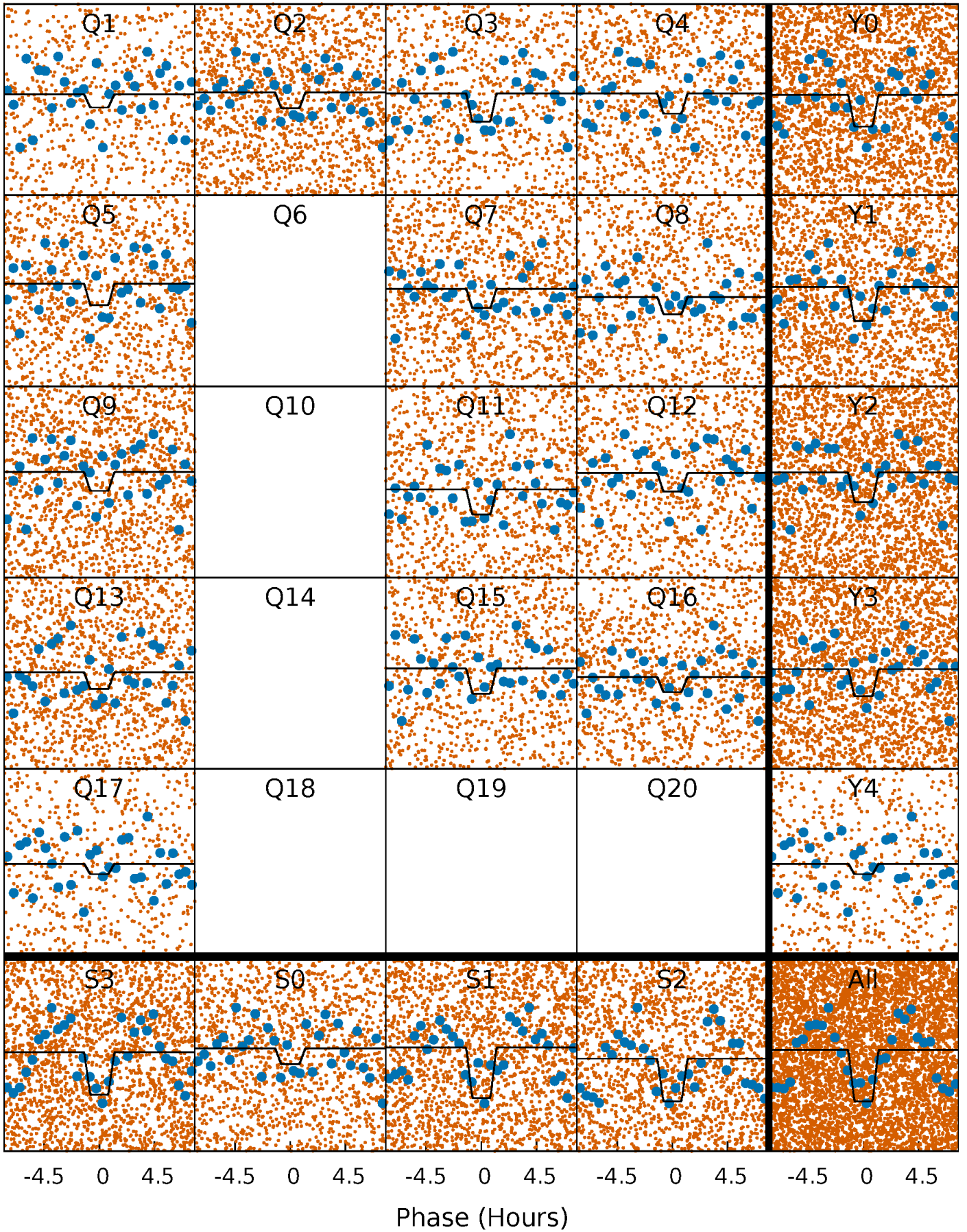
DV Quarter-Phased Transit Curves

TCE 004271930-01 P= 0.892957 Days $T_0=131.796601$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

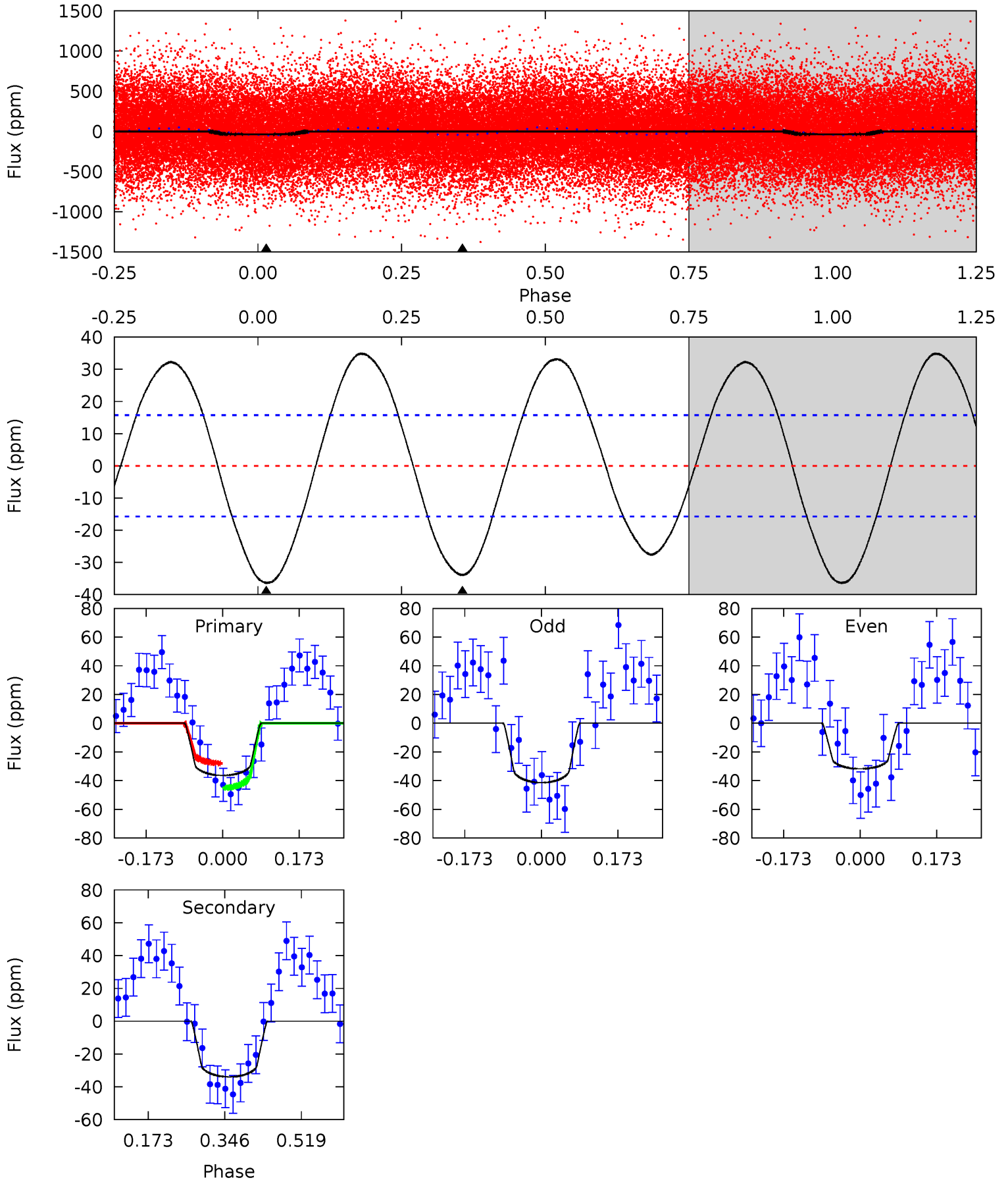
TCE 004271930-01 P= 0.893012 Days $T_0=131.774140$ (BKJD)



DV Model-Shift Uniqueness Test

004271930-01, P = 0.892957 Days, E = 130.903644 Days

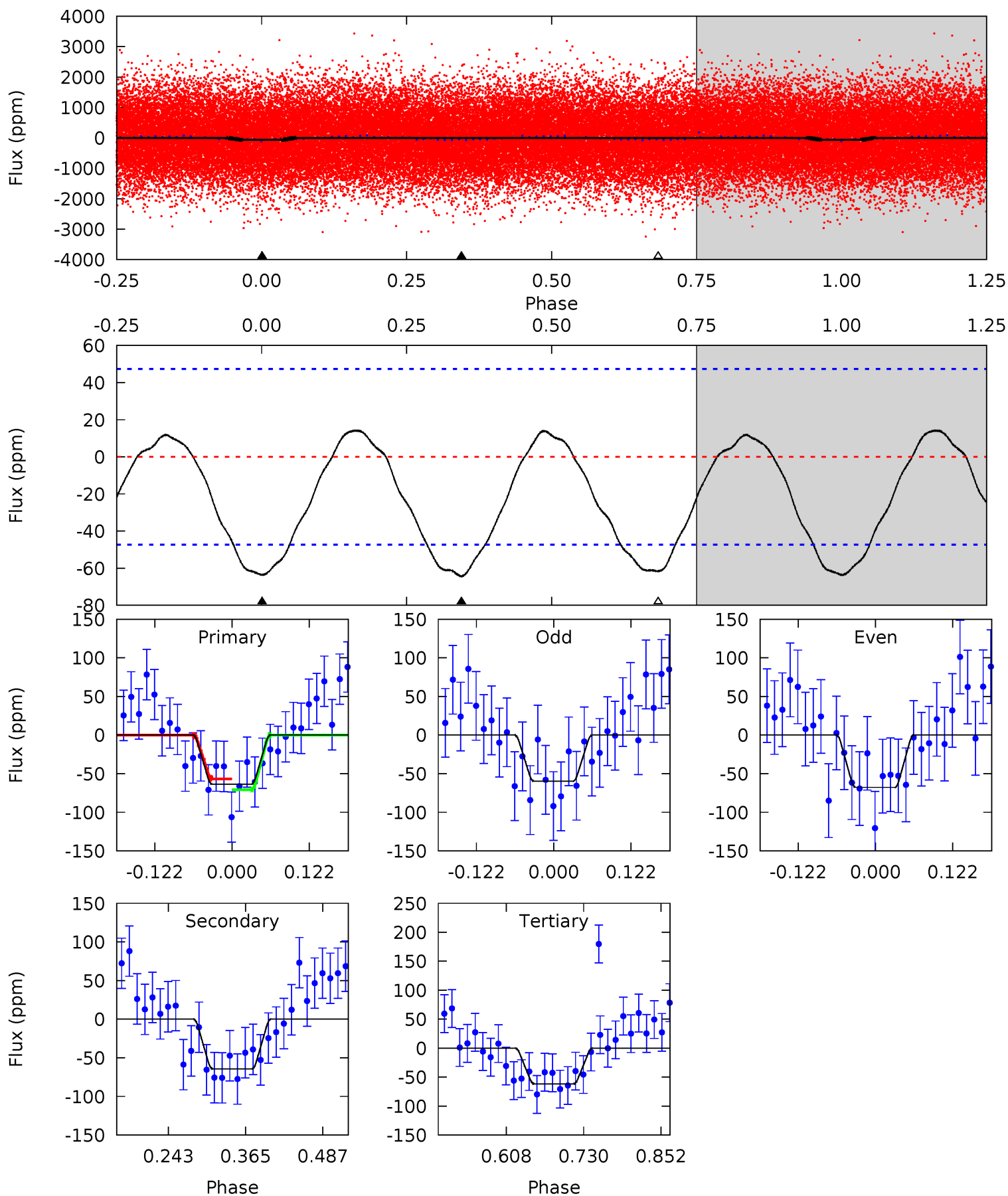
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.3	9.59	0	0	4.45	1.36	5.80	10.3	10.3	9.59	9.59	1.37	0.91	0.49	2.44



Alt Model-Shift Uniqueness Test

004271930-01, P = 0.893012 Days, E = 130.881128 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.09	6.16	5.90	0	4.52	1.55	2.51	0.19	6.09	0.26	6.16	0.38	0.89	0.18	0.67



Stellar Parameters For KIC 004271930

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	8605^{+77}_{-86}	$4.182^{+0.090}_{-0.090}$	$-0.380^{+0.050}_{-0.150}$	$1.731^{+0.242}_{-0.242}$	$1.660^{+0.081}_{-0.128}$	$0.451^{+0.187}_{-0.132}$
	+1%/-1%	+2%/-2%	+13%/-39%	+14%/-14%	+5%/-8%	+41%/-29%
Source	SPE68	SPE68	SPE68	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 004271930-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-34 ± 4	$1.19^{+0.61}_{-0.60}$	4755^{+187}_{-154}	8032^{+5863}_{-1745}	$5.965^{+18.013}_{-3.298}$
Alt.	-64 ± 10	$1.64^{+0.68}_{-0.64}$	4765^{+174}_{-166}	7998^{+3531}_{-1488}	$5.904^{+10.253}_{-2.954}$

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{\text{obs}} \gg T_{\text{max}}$ AND $A_{\text{obs}} \gg 1.0$

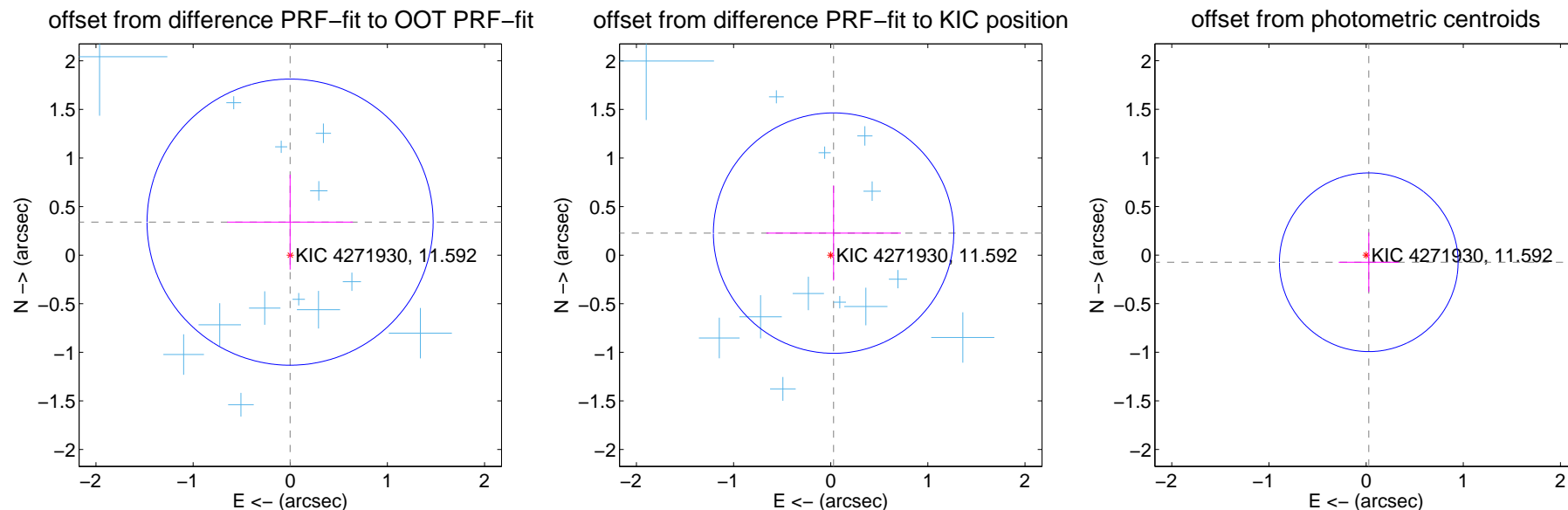
DV Centroid Data

Supplemental centroid analysis for 004271930-01. **Kepler magnitude: 11.59.** Transit SNR 8.39

There are 13 quarters with good PRF difference image offsets

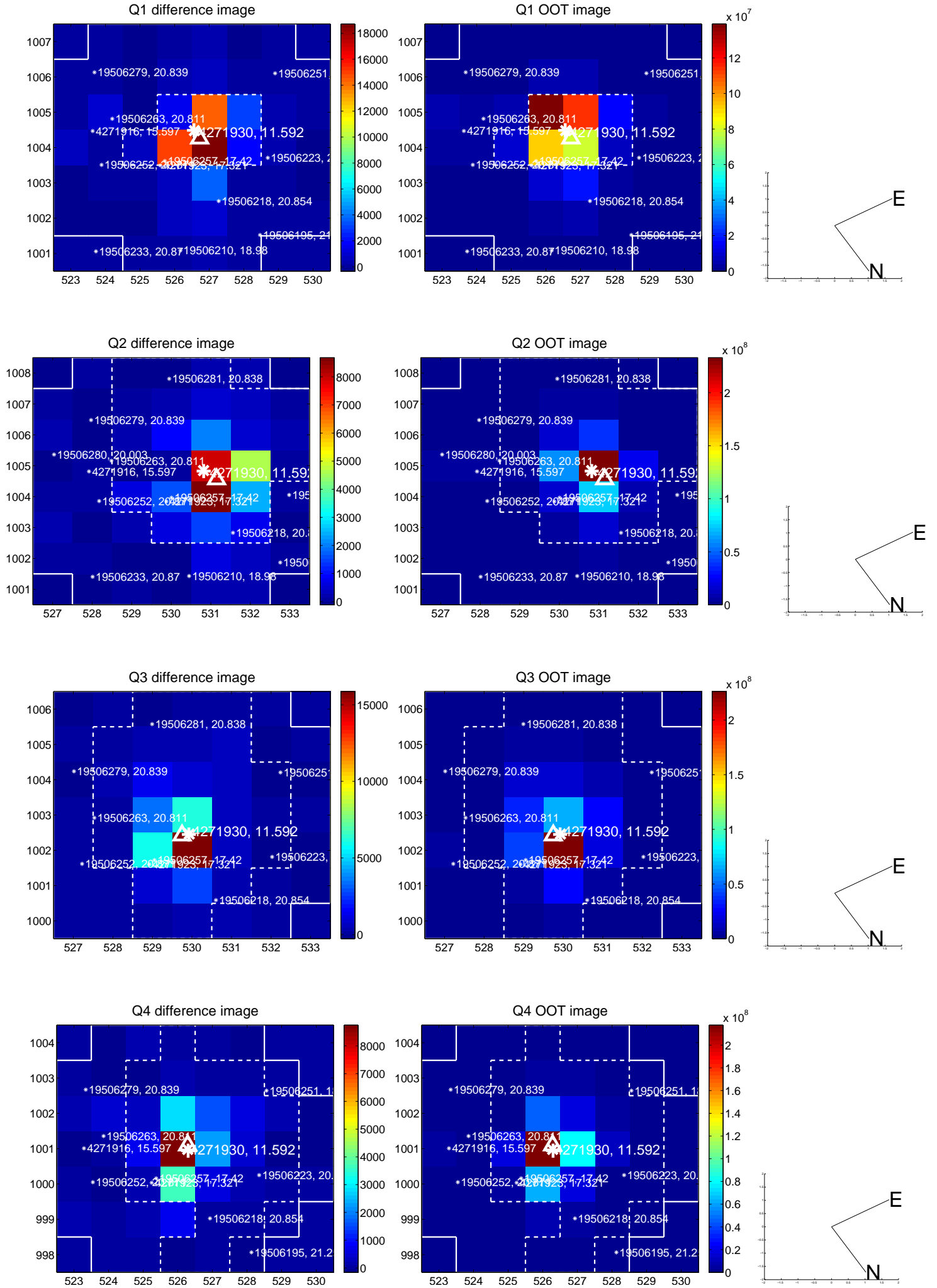
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.340 ± 0.491	0.69	0.002 ± 0.647	0.340 ± 0.488
PRF-fit source offset from KIC position	0.229 ± 0.412	0.55	-0.029 ± 0.692	0.227 ± 0.488
photometric centroid source offset	0.08 ± 0.31	0.26	-0.03 ± 0.31	-0.07 ± 0.31

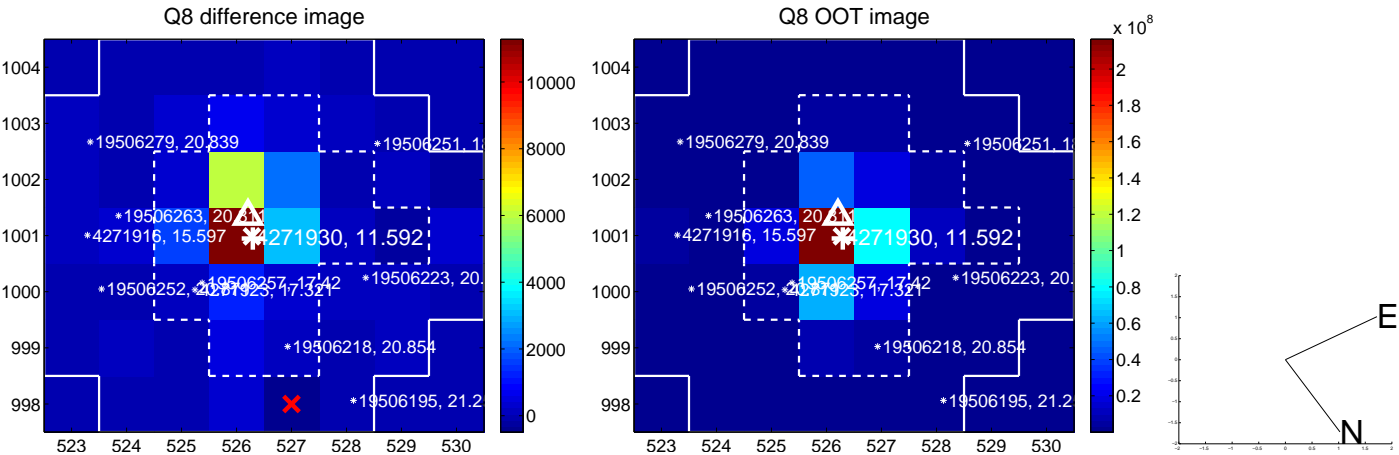
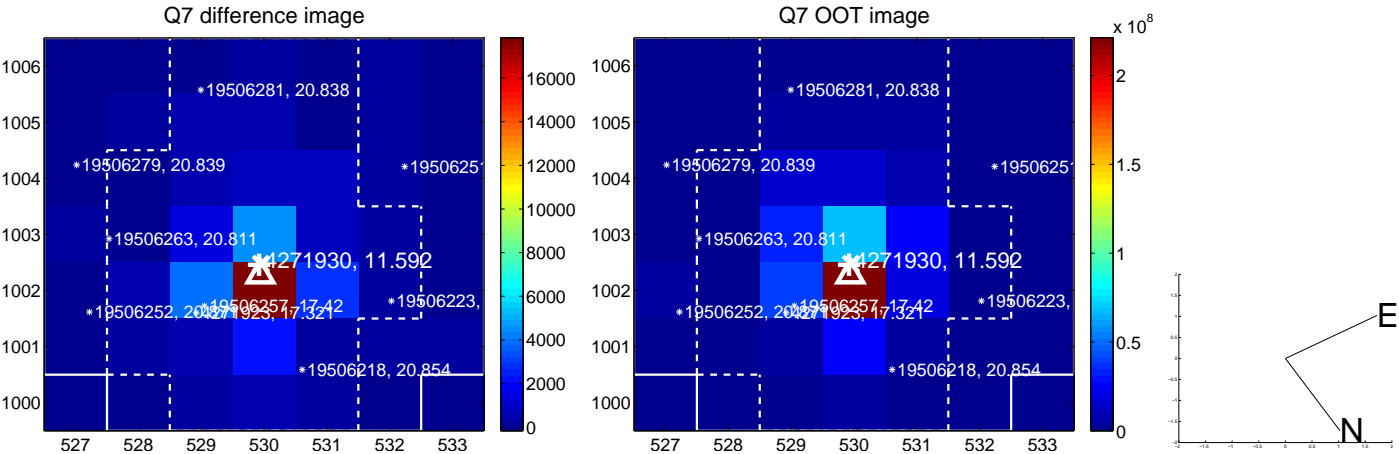
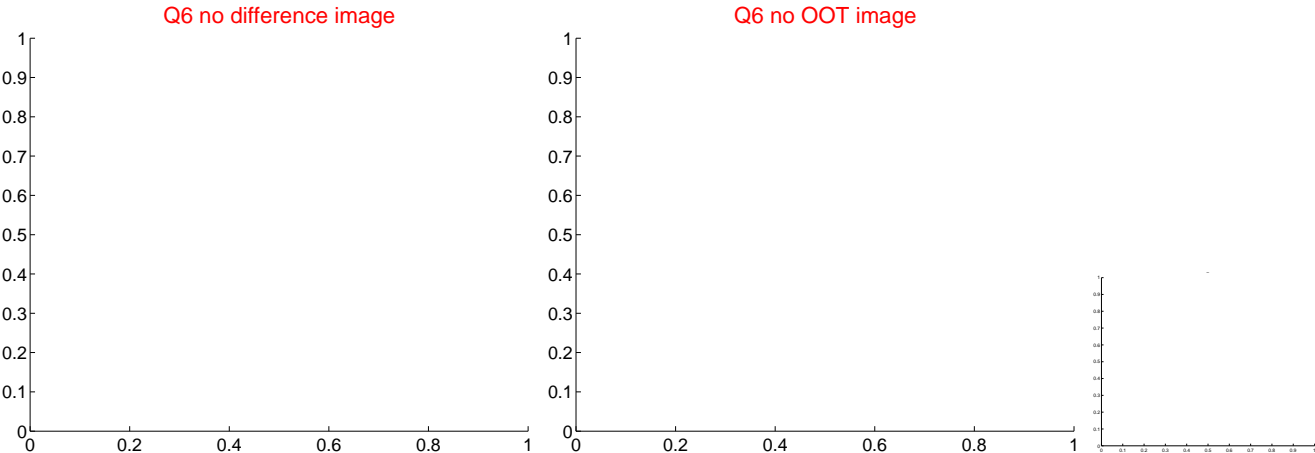
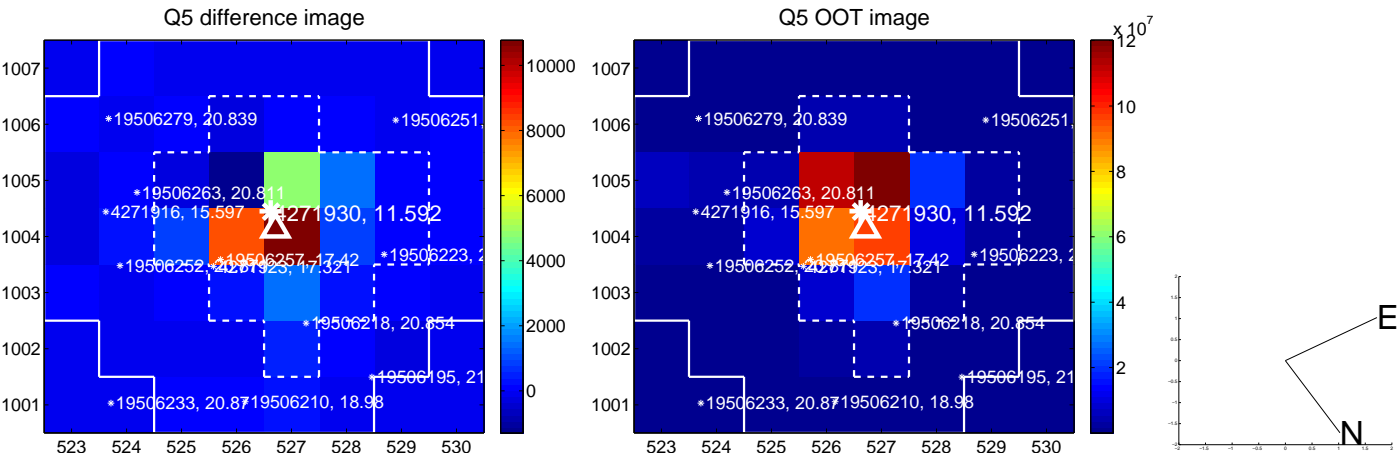


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

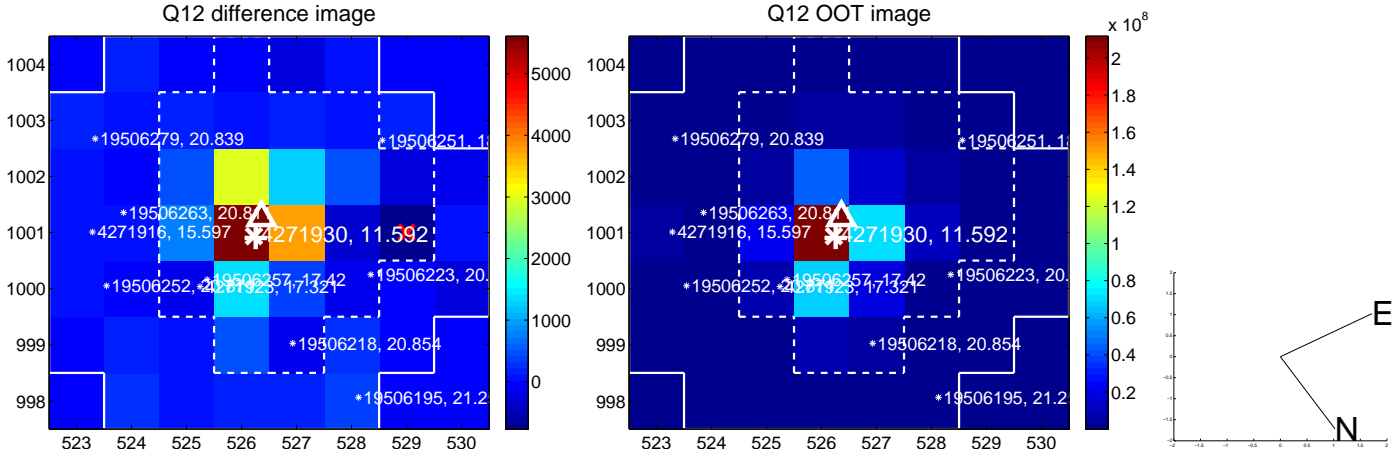
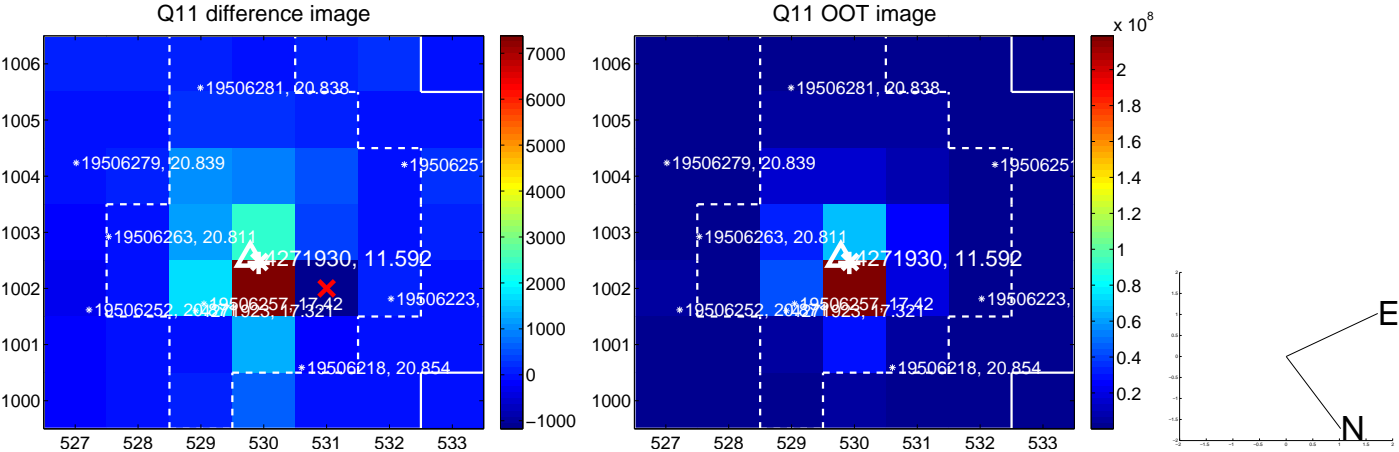
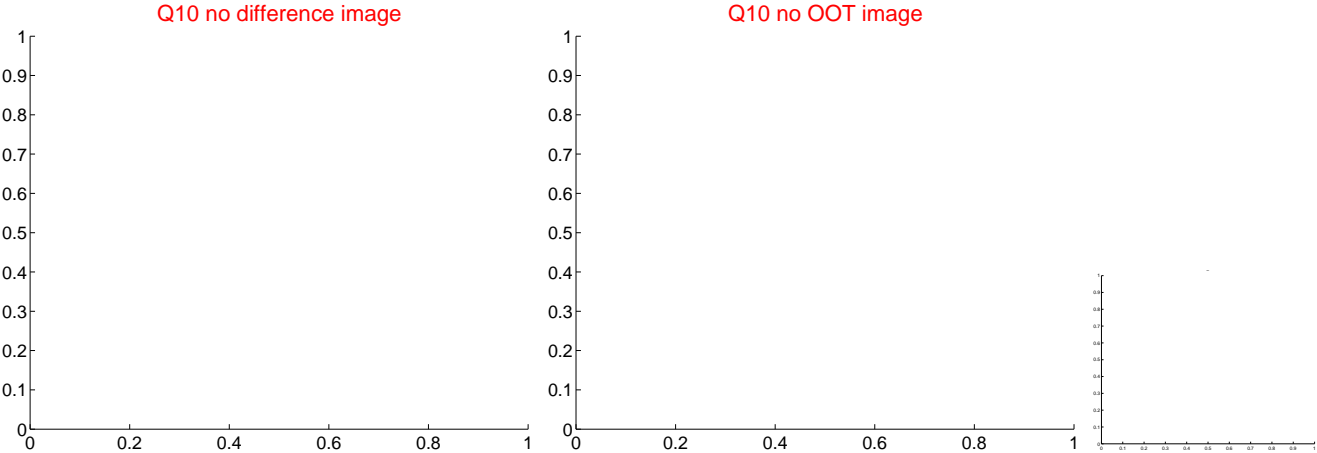
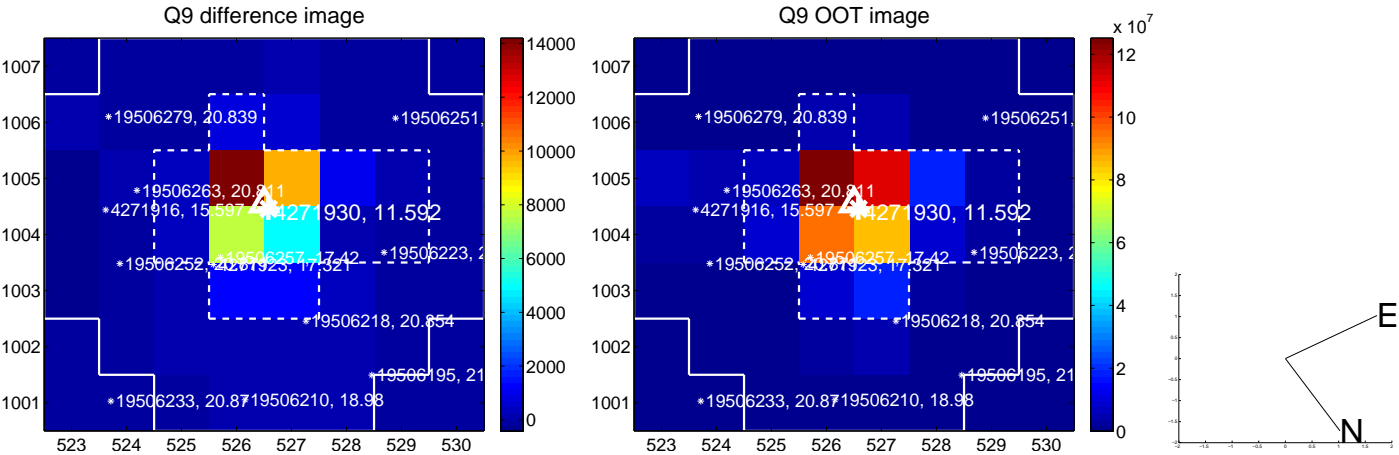
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



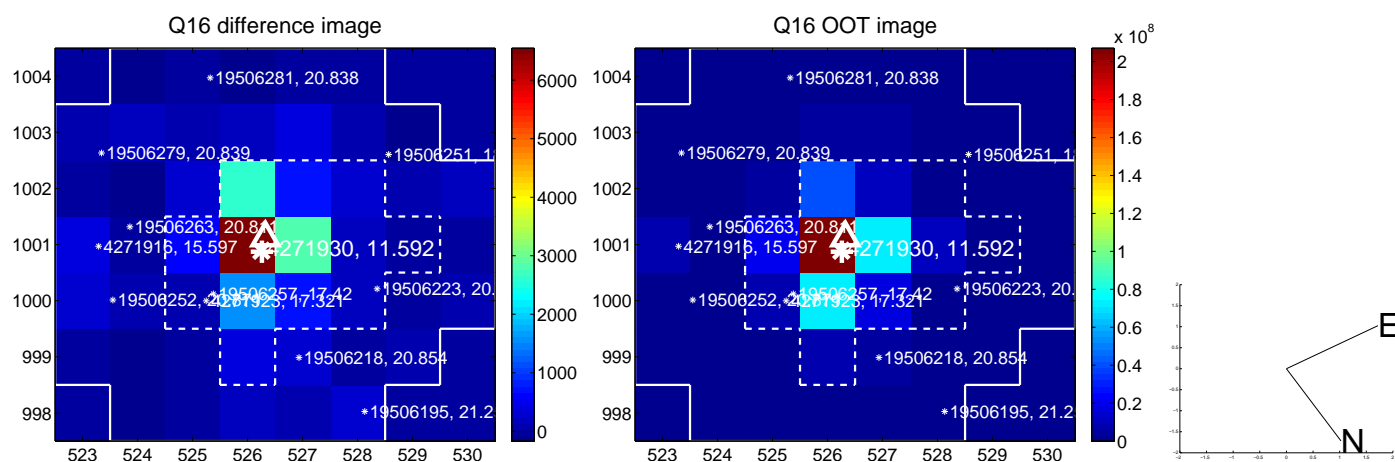
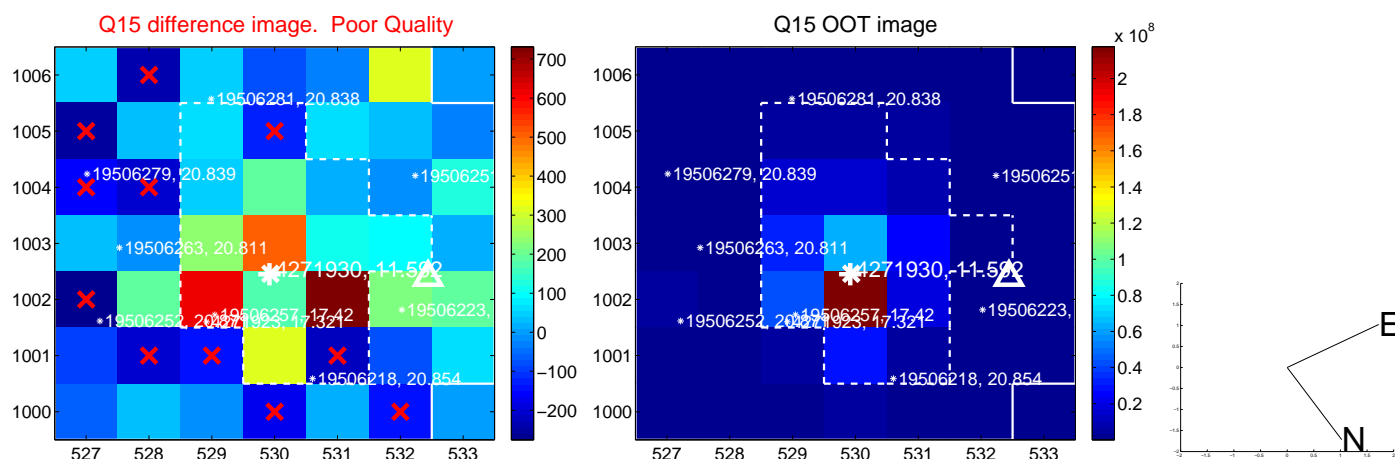
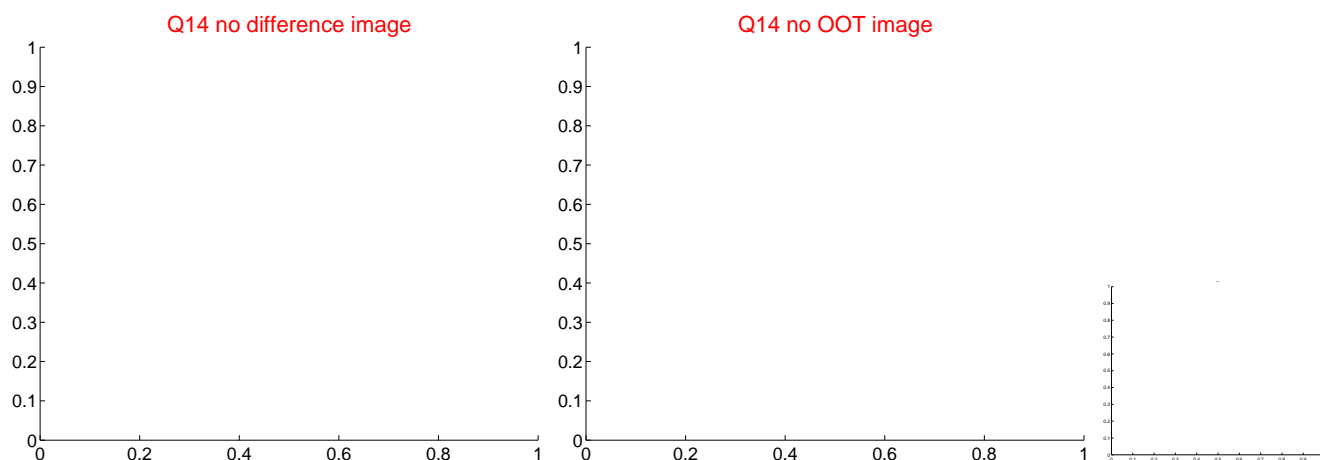
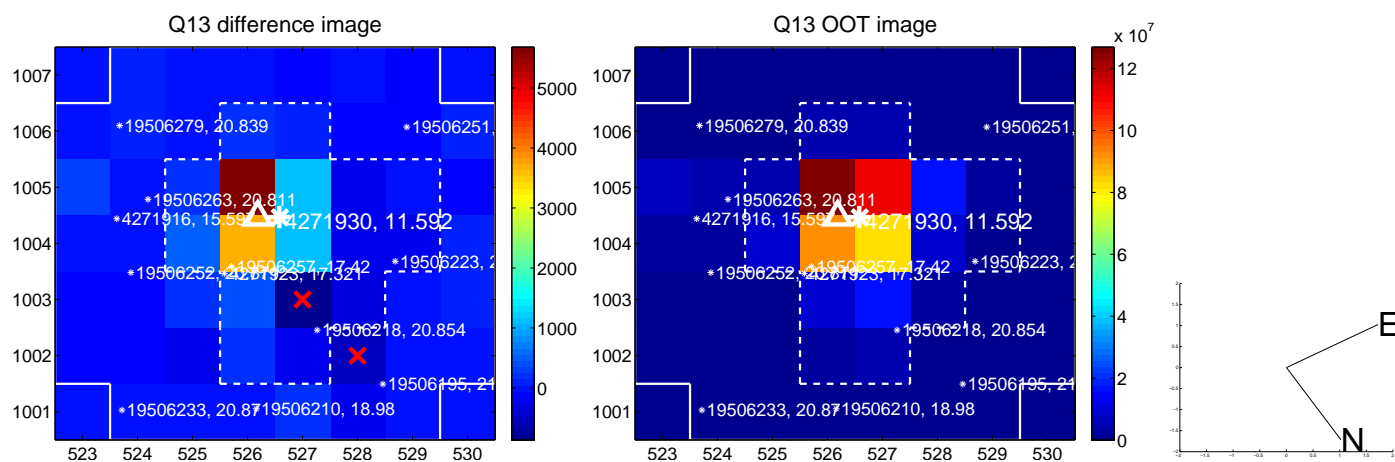
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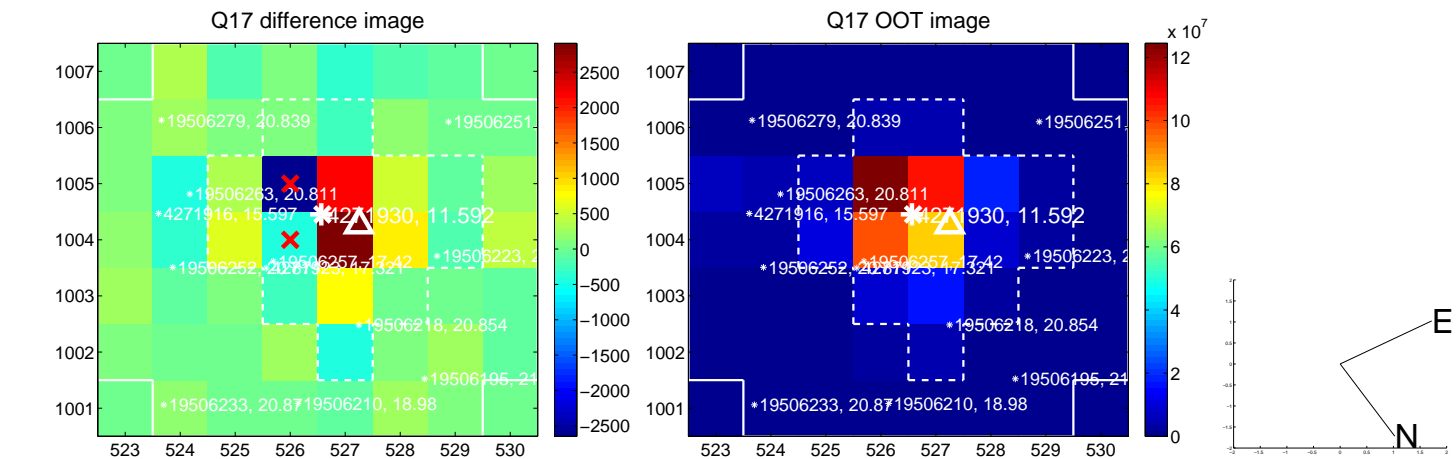
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



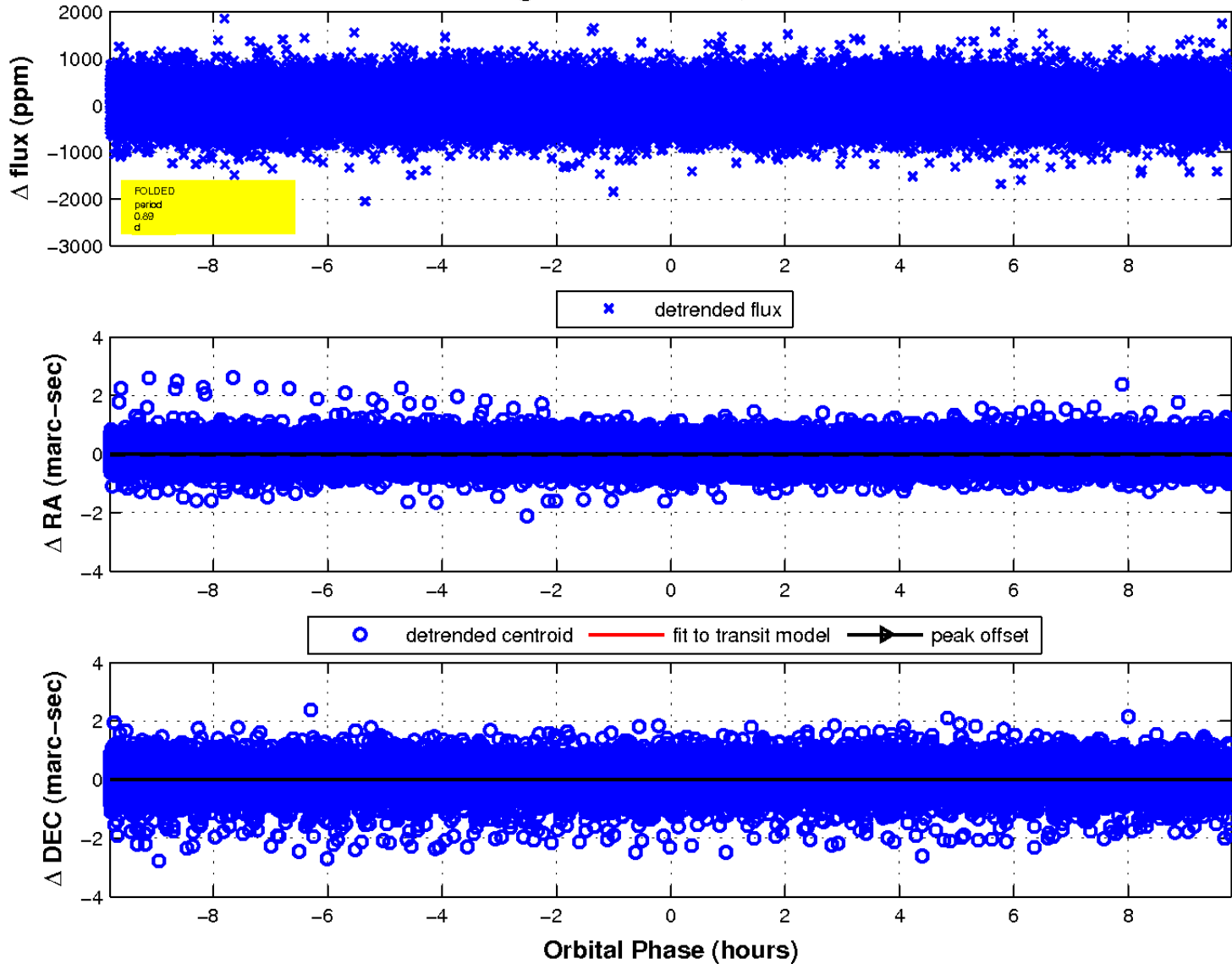
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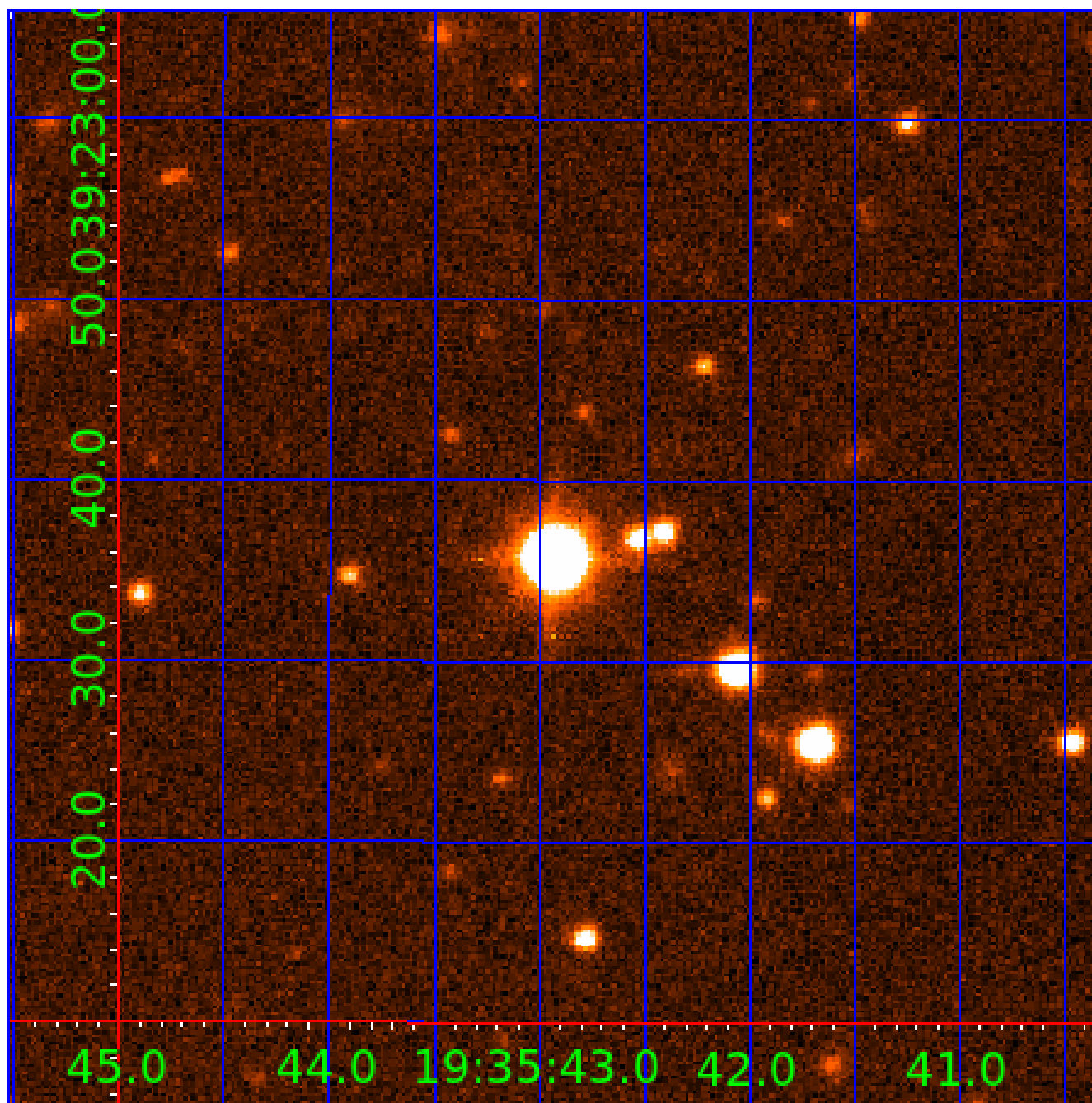


fluxWeightedCentroids, Planet 1 of 4



UKIRT Image

Declination



KIC 004271930

Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
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004271930-03	OBS	No	0.595341	132.066106	64.4	2.806	9.1	10.6	1.73	8605	1.61	54669.06
004271930-04	OBS	No	26.289359	153.789839	465.2	3.389	7.9	11.6	1.73	8605	4.24	350.26

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004271930-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
004271930-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT
004271930-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT
004271930-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

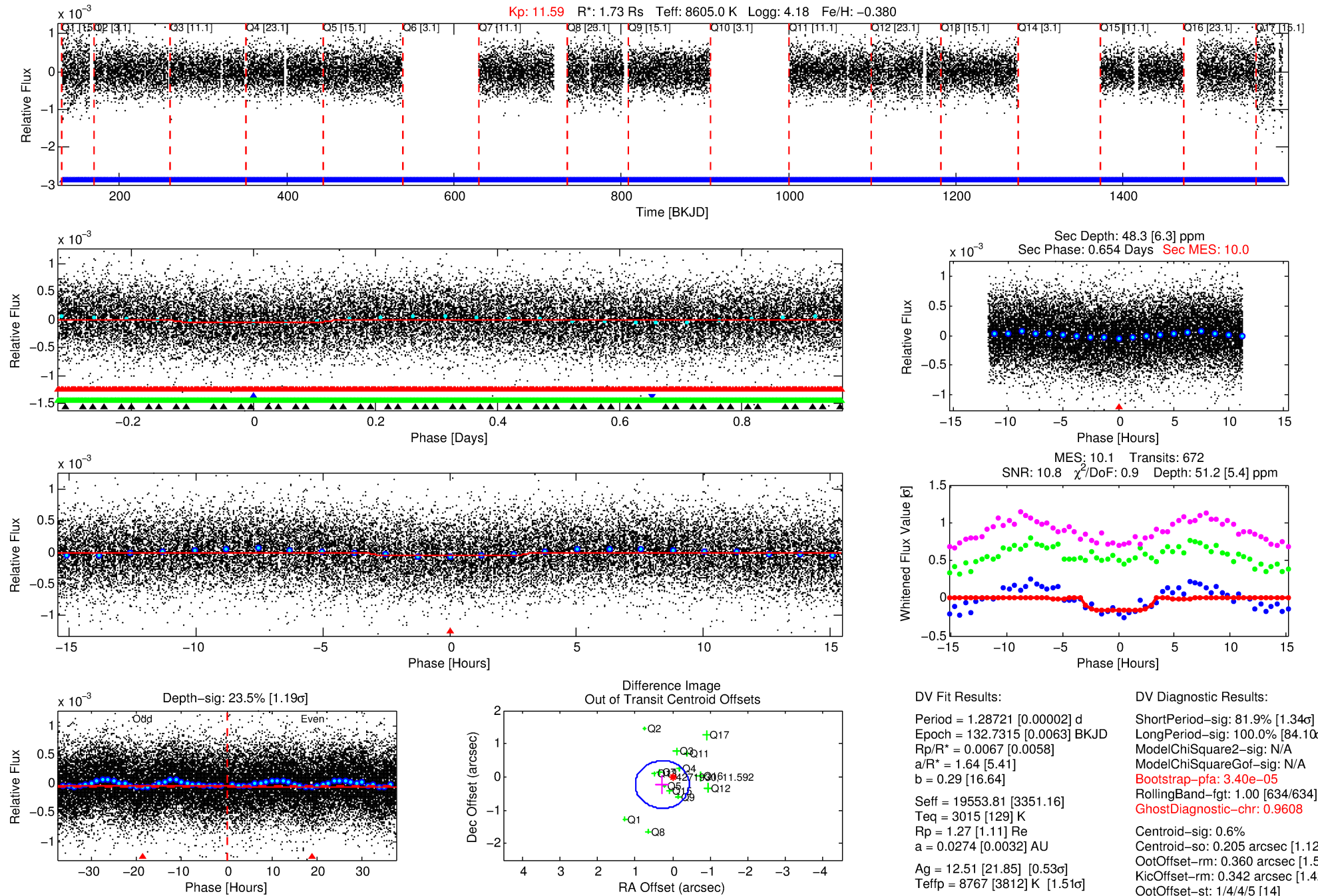
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004271930-02

No Significant Match Found

DV One-Page Summary

KIC: 4271930 Candidate: 2 of 4 Period: 1.287 d



DV Fit Results:

Period = 1.28721 [0.00002] d
Epoch = 132.7315 [0.0063] BKJD
Rp/R* = 0.0067 [0.0058]
a/R* = 1.64 [5.41]
b = 0.29 [16.64]
Seff = 19553.81 [3351.16]
Teff = 3015 [129] K
Rp = 1.27 [1.11] Re
a = 0.0274 [0.0032] AU
Ag = 12.51 [21.85] [0.53 σ]
Teffp = 8767 [3812] K [1.51 σ]

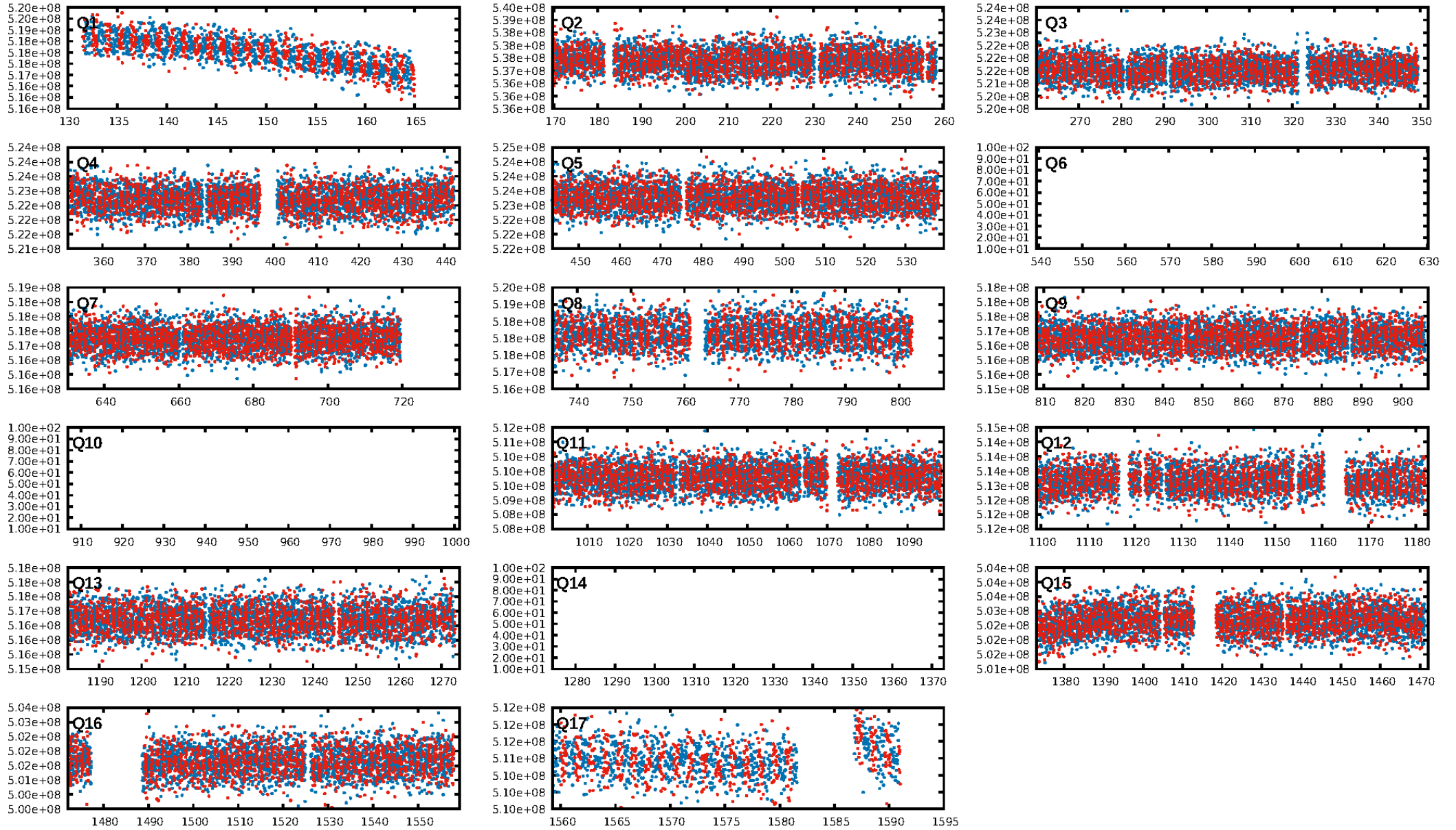
DV Diagnostic Results:

ShortPeriod-sig: 81.9% [1.34 σ]
LongPeriod-sig: 100.0% [84.10 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 3.40e-05
RollingBand-fgt: 1.00 [634/634]
GhostDiagnostic-chr: 0.9608
Centroid-sig: 0.6%
Centroid-so: 0.205 arcsec [1.12 σ]
OotOffset-rm: 0.360 arcsec [1.51 σ]
KicOffset-rm: 0.342 arcsec [1.42 σ]
OotOffset-st: 1/4/4/5 [14]
KicOffset-st: 1/4/4/5 [14]
DiffImageQuality-fgm: 1.00 [14/14]
DiffImageOverlap-fno: 0.00 [0/14]

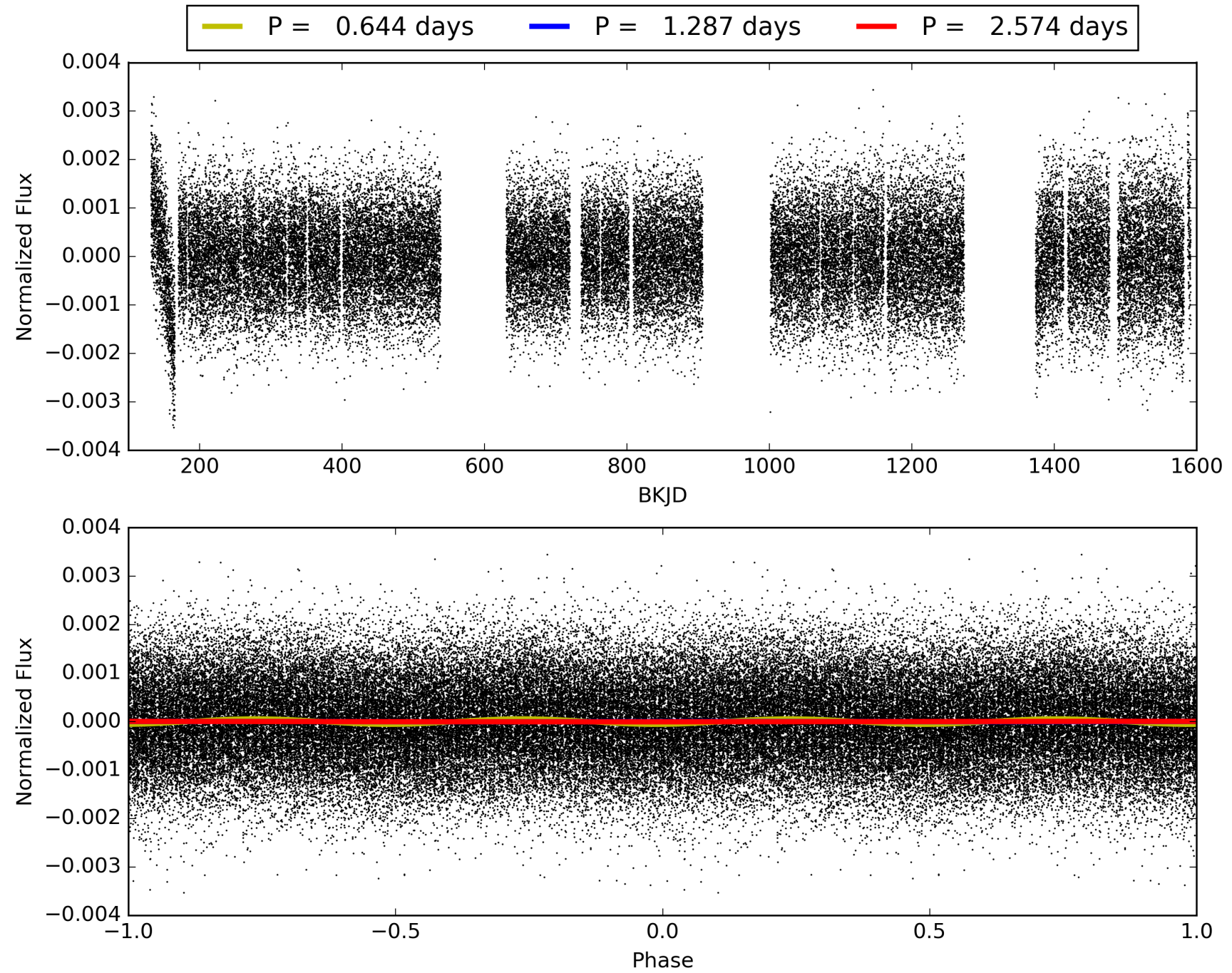
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 04:57:08 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 004271930-02, PDC Light Curves

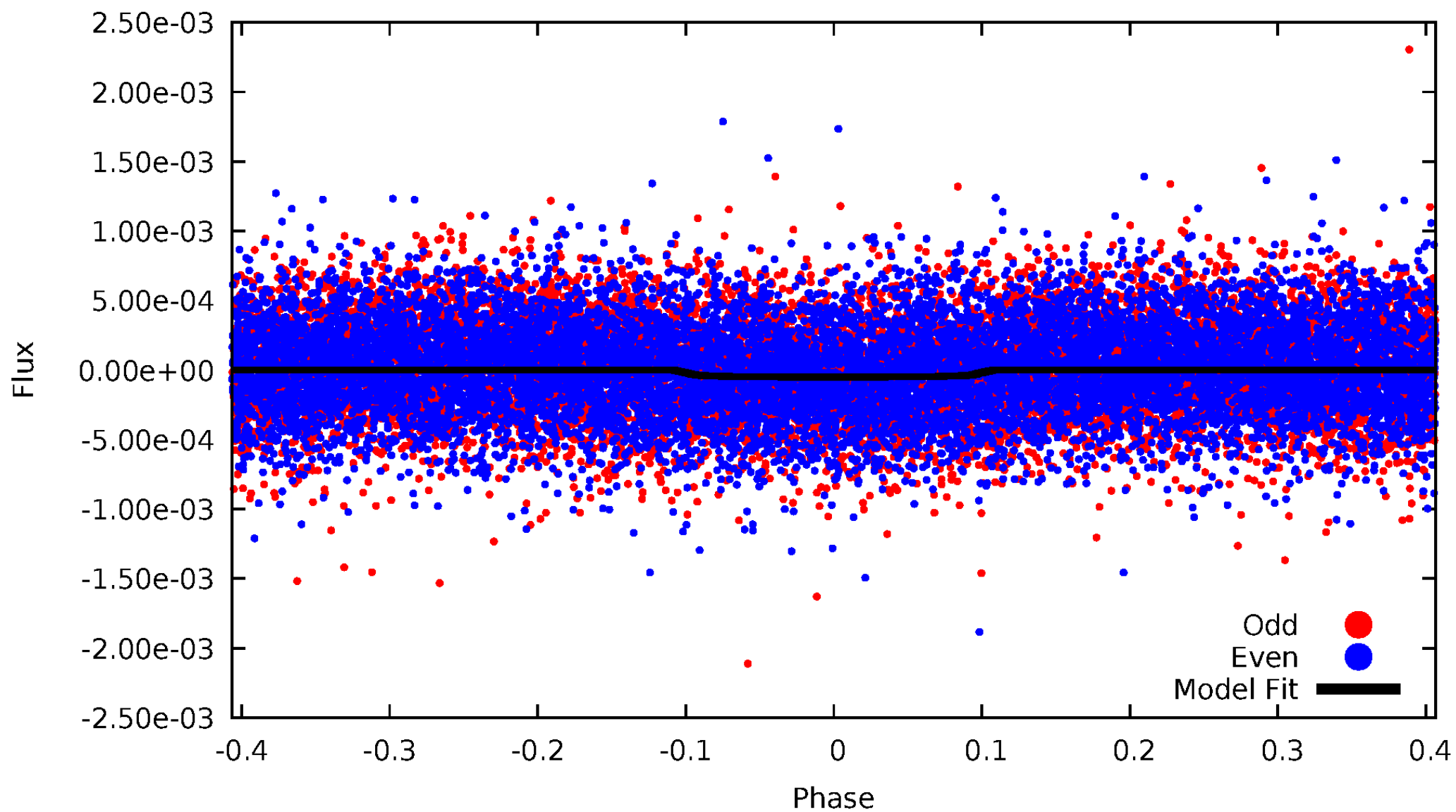


TCE 004271930-02



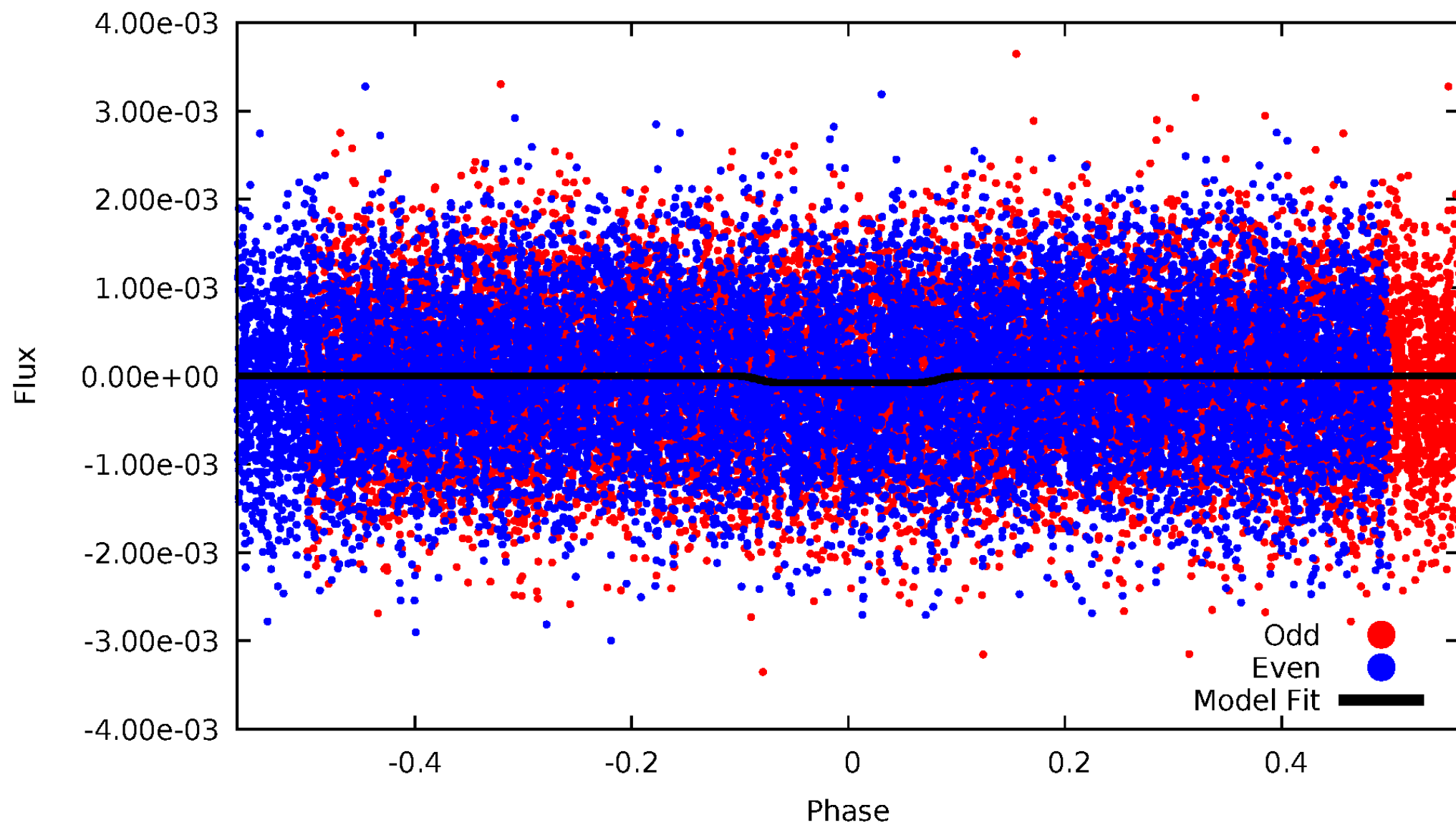
DV Odd/Even

TCE 004271930-02



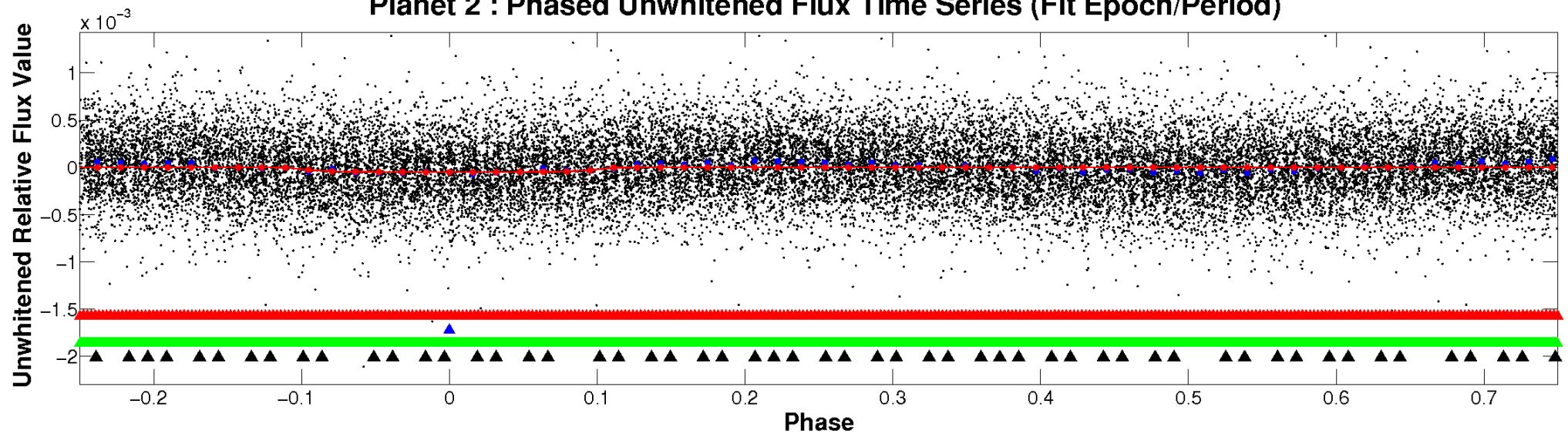
ALT Odd/Even

TCE 004271930-02

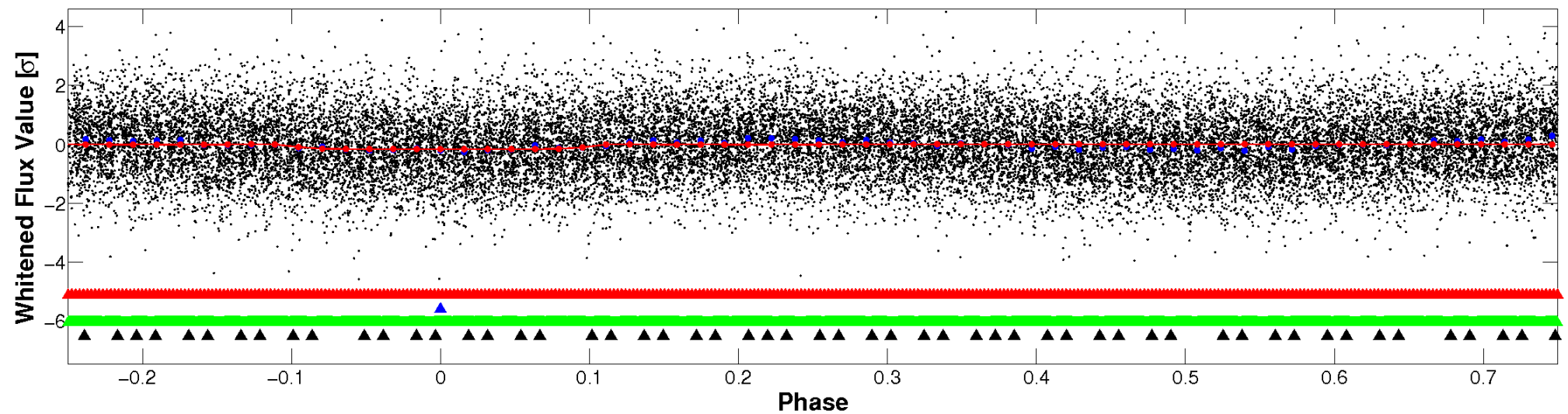


Non-Whitened Vs. Whitened Light Curve

Planet 2 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

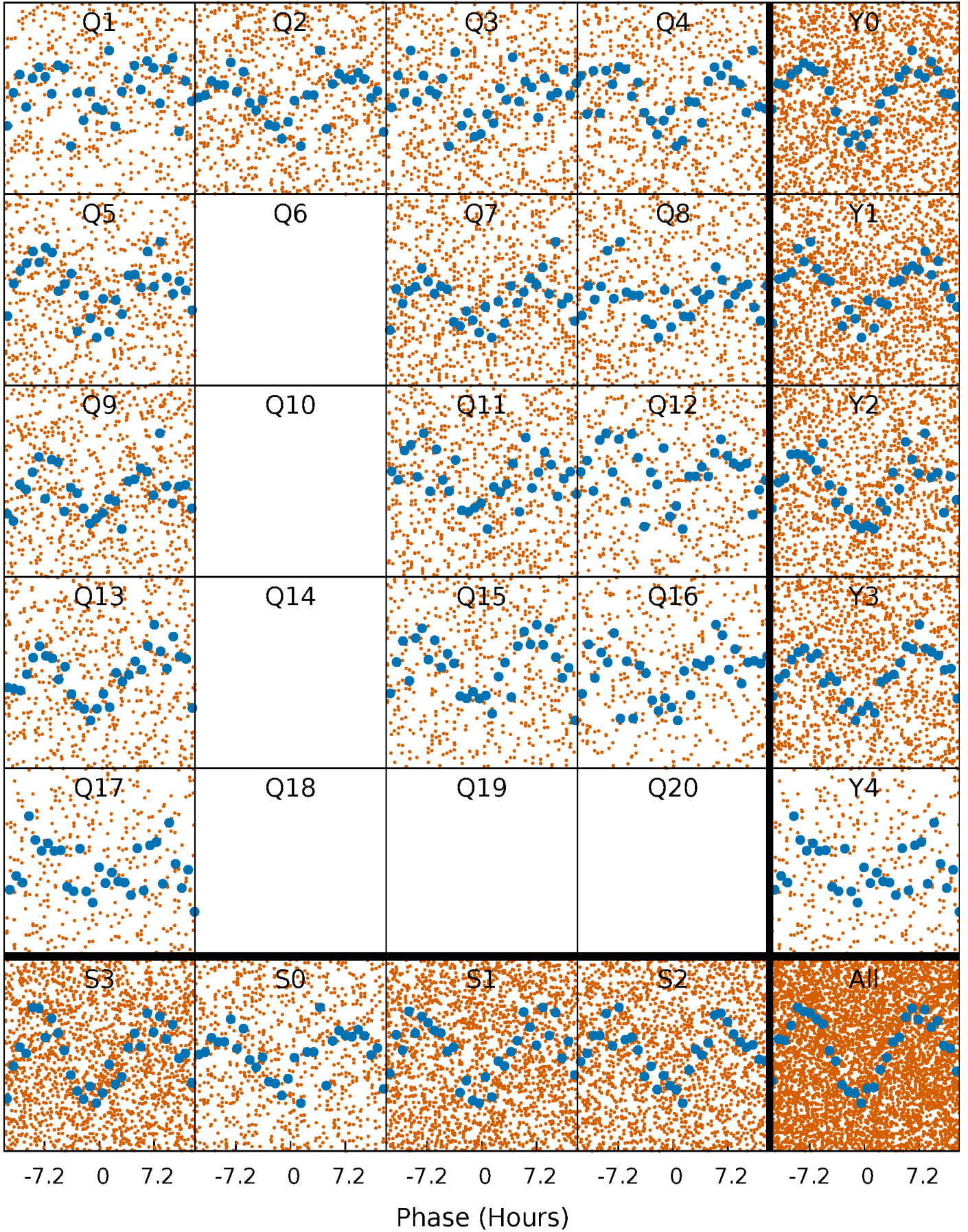


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



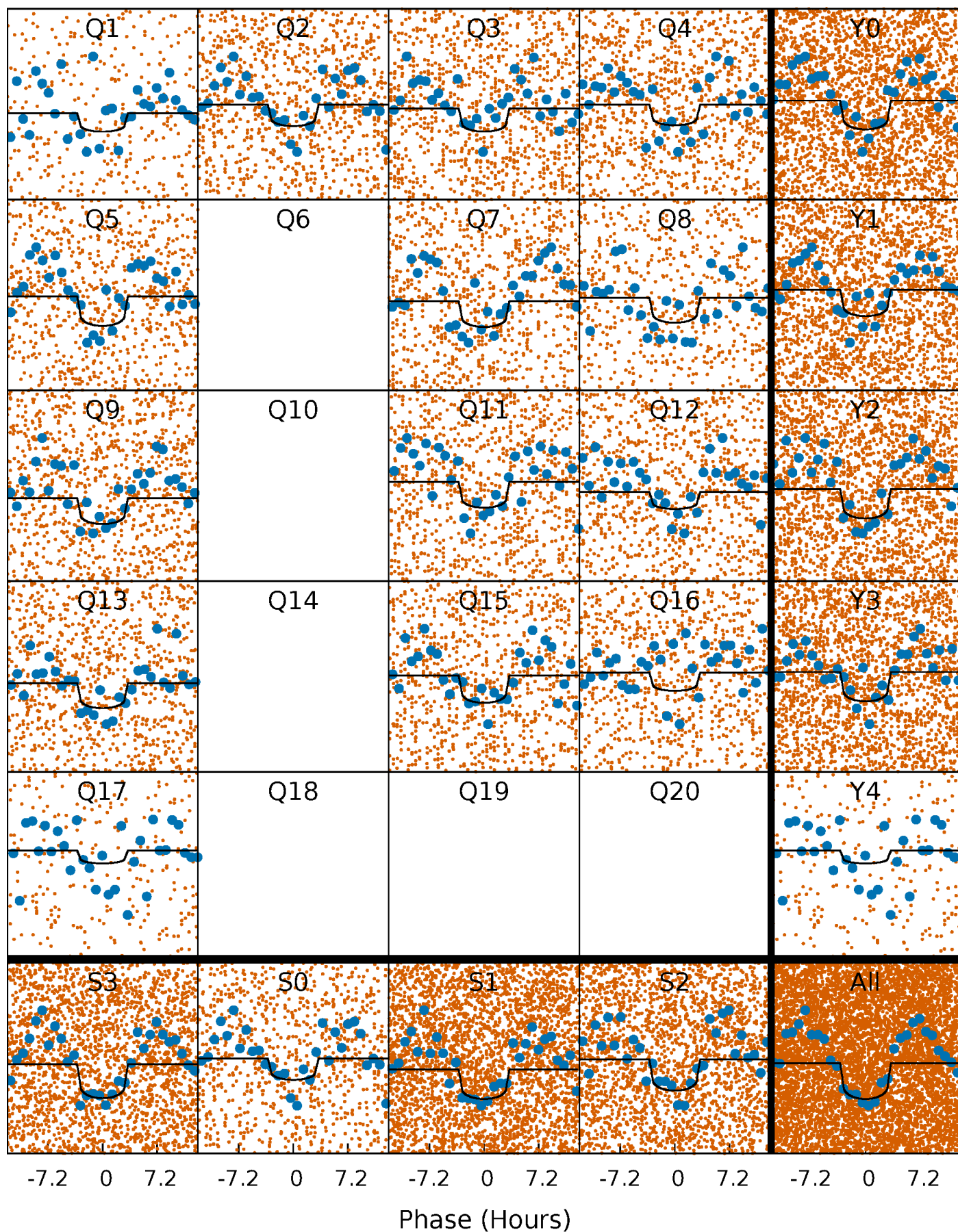
PDC Quarter-Phased Transit Curves

TCE 004271930-02 $P = 1.287207$ Days $T_0 = 132.731536$ (BKJD)



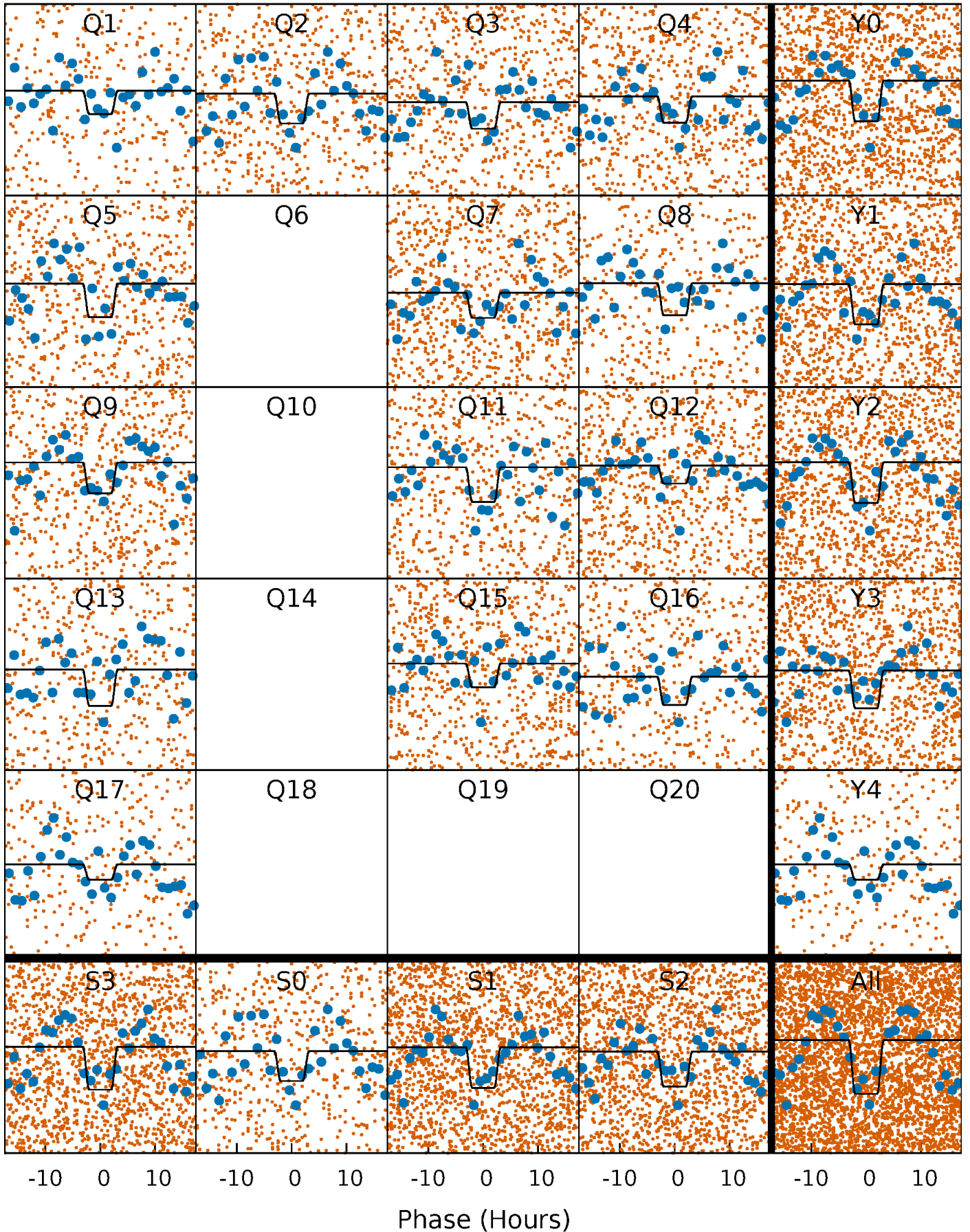
DV Quarter-Phased Transit Curves

TCE 004271930-02 P= 1.287207 Days $T_0=132.731536$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

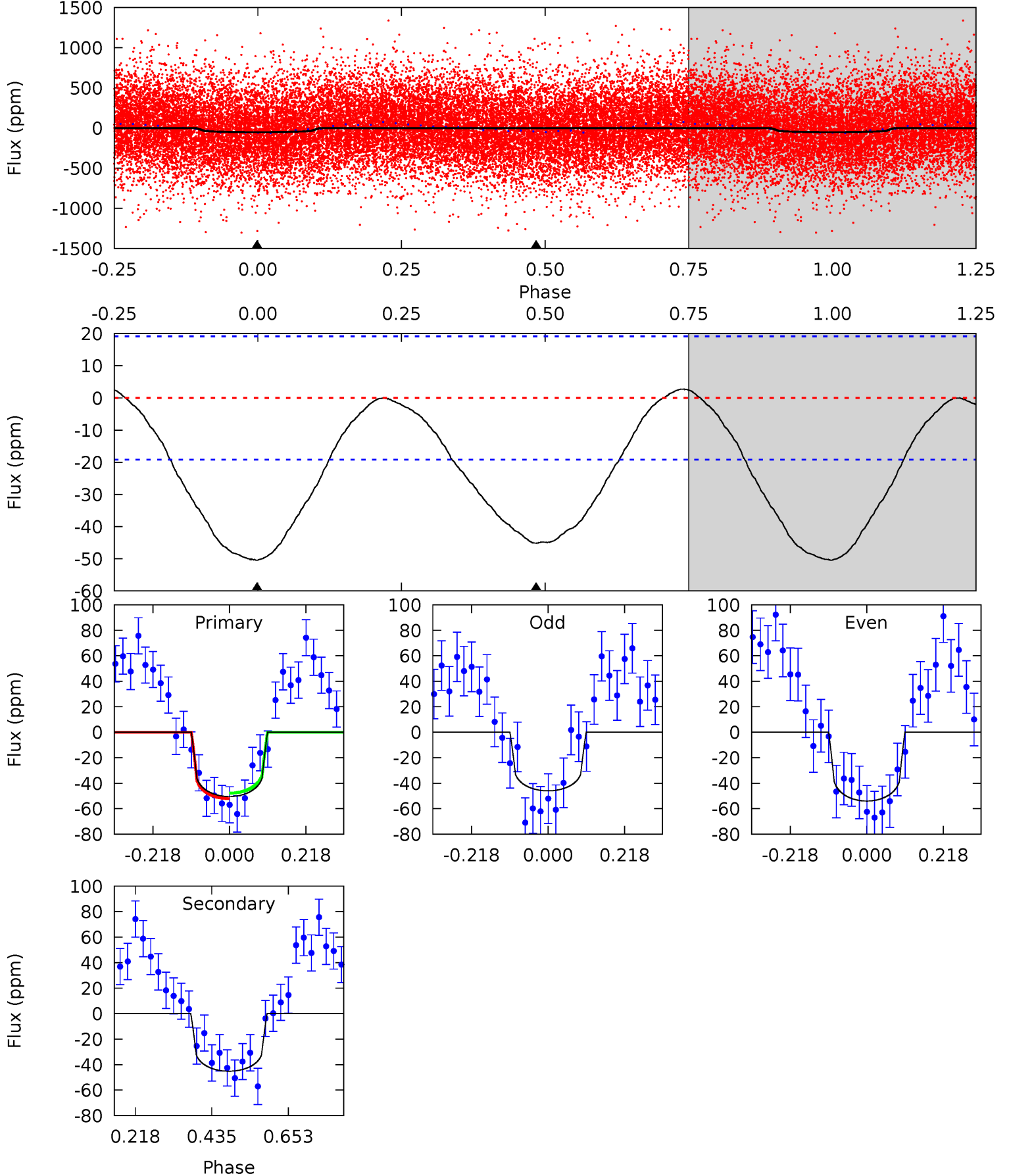
TCE 004271930-02 P= 1.287273 Days $T_0=132.683828$ (BKJD)



DV Model-Shift Uniqueness Test

004271930-02, P = 1.287207 Days, E = 131.444329 Days

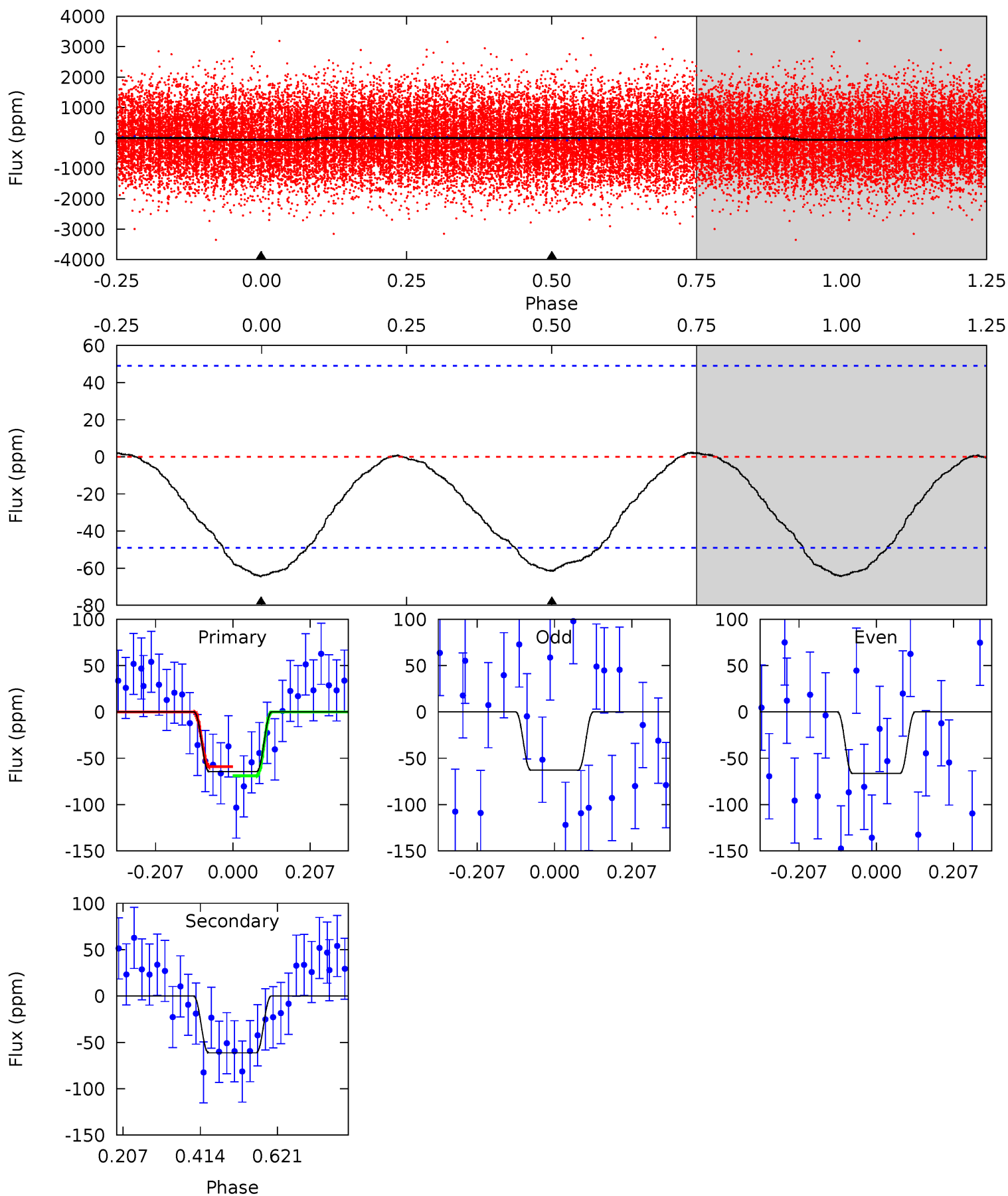
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.6	10.3	0	0	4.40	1.23	0.42	11.6	11.6	10.3	10.3	0.92	1.06	0.05	0.50



Alt Model-Shift Uniqueness Test

004271930-02, P = 1.287273 Days, E = 131.396555 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.79	5.52	0	0	4.41	1.26	0.17	5.79	5.79	5.52	5.52	0.16	0.97	0.03	0.44



Stellar Parameters For KIC 004271930

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	8605^{+77}_{-86}	$4.182^{+0.090}_{-0.090}$	$-0.380^{+0.050}_{-0.150}$	$1.731^{+0.242}_{-0.242}$	$1.660^{+0.081}_{-0.128}$	$0.451^{+0.187}_{-0.132}$
	+1%/-1%	+2%/-2%	+13%/-39%	+14%/-14%	+5%/-8%	+41%/-29%
Source	SPE68	SPE68	SPE68	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 004271930-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-45 ± 4	$1.44^{+0.97}_{-0.88}$	4213^{+151}_{-139}	7891^{+8636}_{-2080}	$8.983^{+48.184}_{-5.802}$
Alt.	-61 ± 11	$1.66^{+1.05}_{-0.89}$	4216^{+151}_{-142}	7755^{+6299}_{-1893}	$8.716^{+32.587}_{-5.473}$

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{\text{obs}} \gg T_{\text{max}}$ AND $A_{\text{obs}} \gg 1.0$

DV Centroid Data

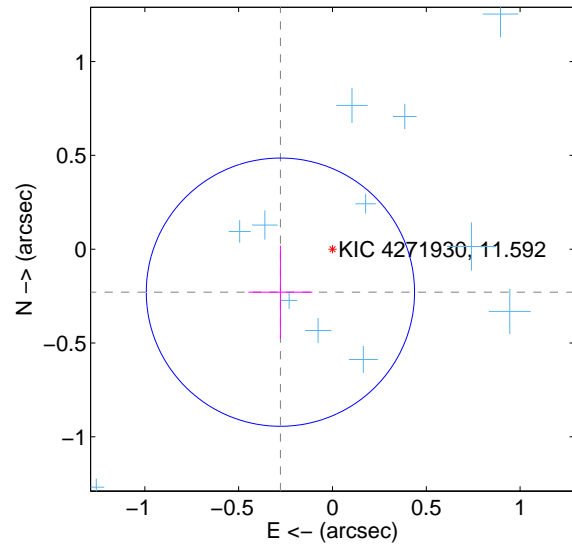
Supplemental centroid analysis for 004271930-02. **Kepler magnitude: 11.59.** Transit SNR 10.80

There are 14 quarters with good PRF difference image offsets

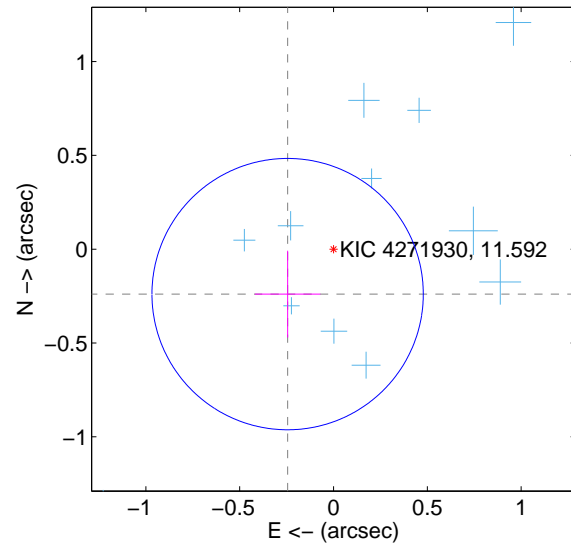
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.360 ± 0.238	1.51	0.277 ± 0.170	-0.229 ± 0.248
PRF-fit source offset from KIC position	0.342 ± 0.241	1.42	0.245 ± 0.175	-0.240 ± 0.231
photometric centroid source offset	0.20 ± 0.18	1.12	0.03 ± 0.18	0.20 ± 0.18

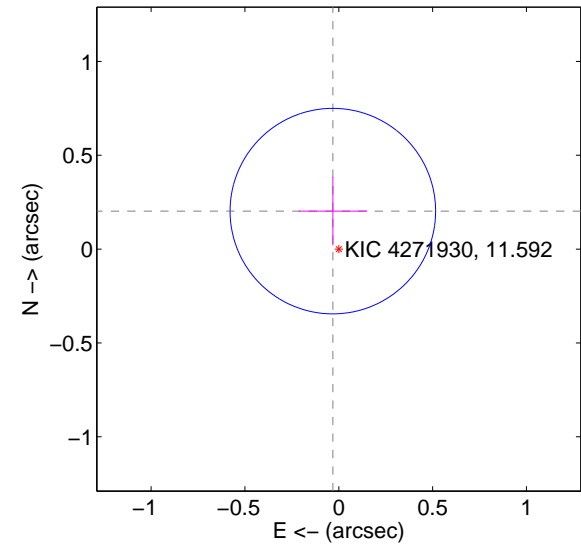
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

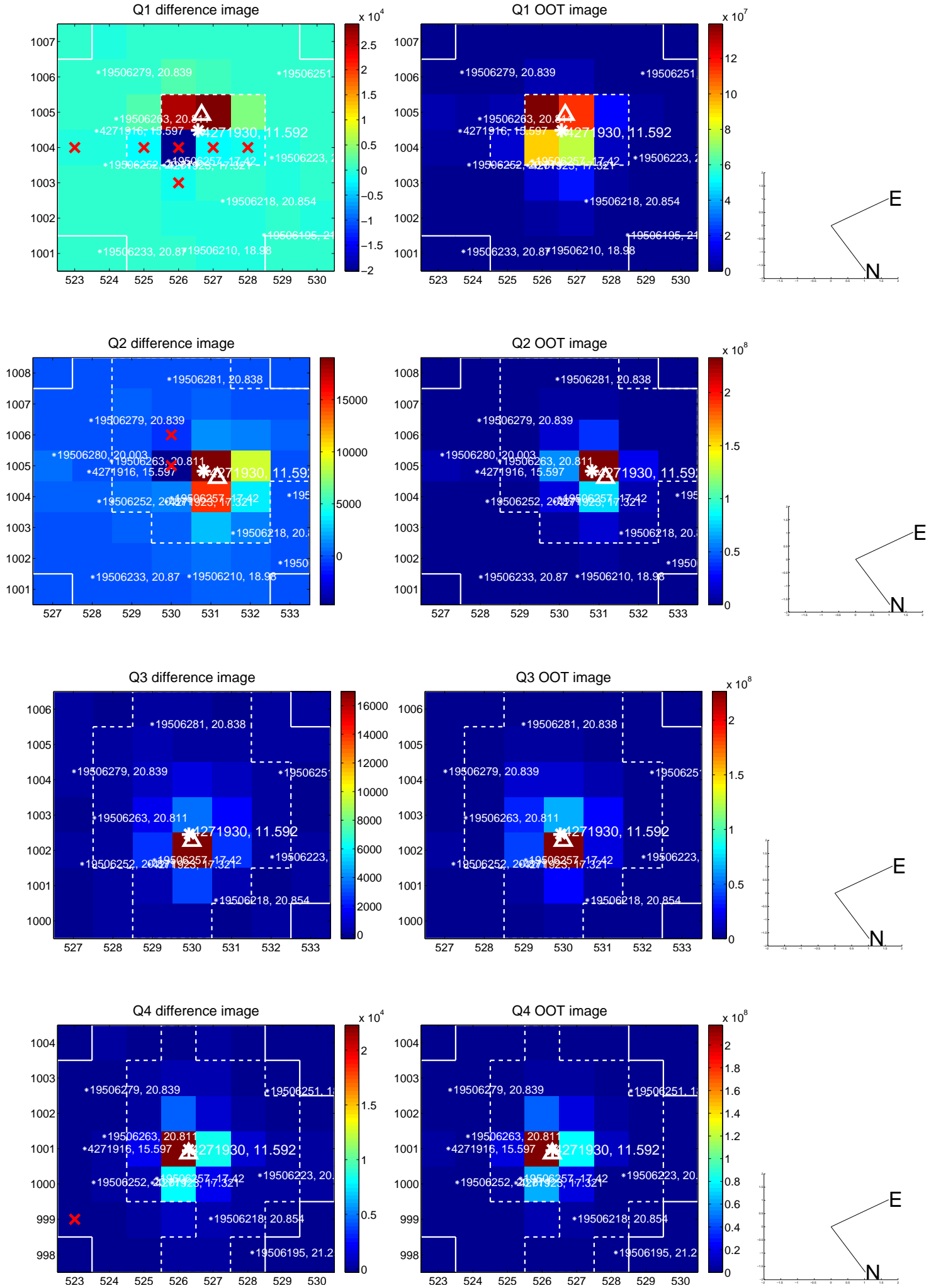


offset from photometric centroids

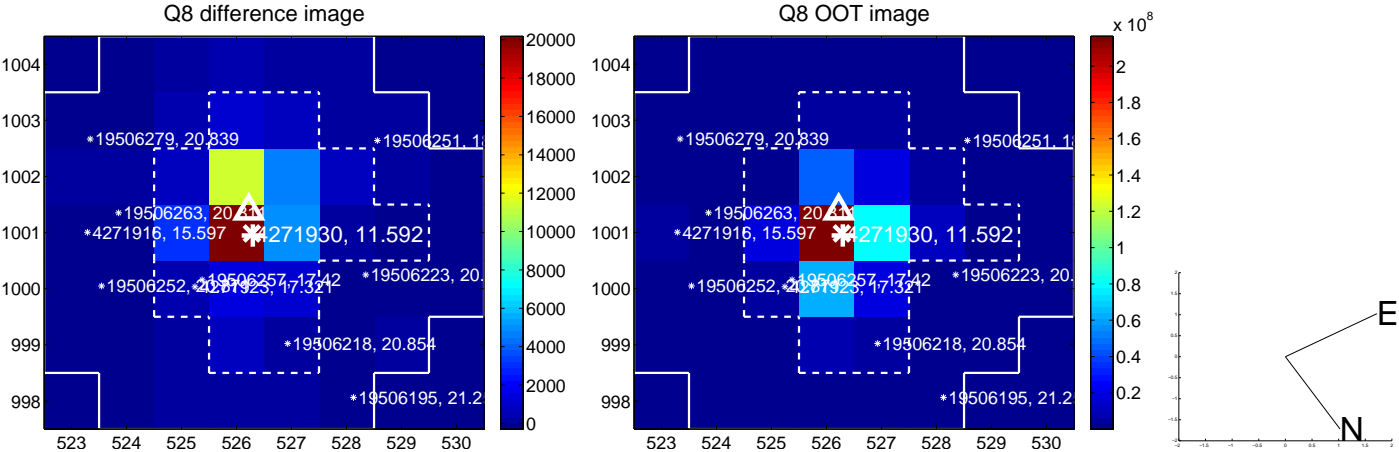
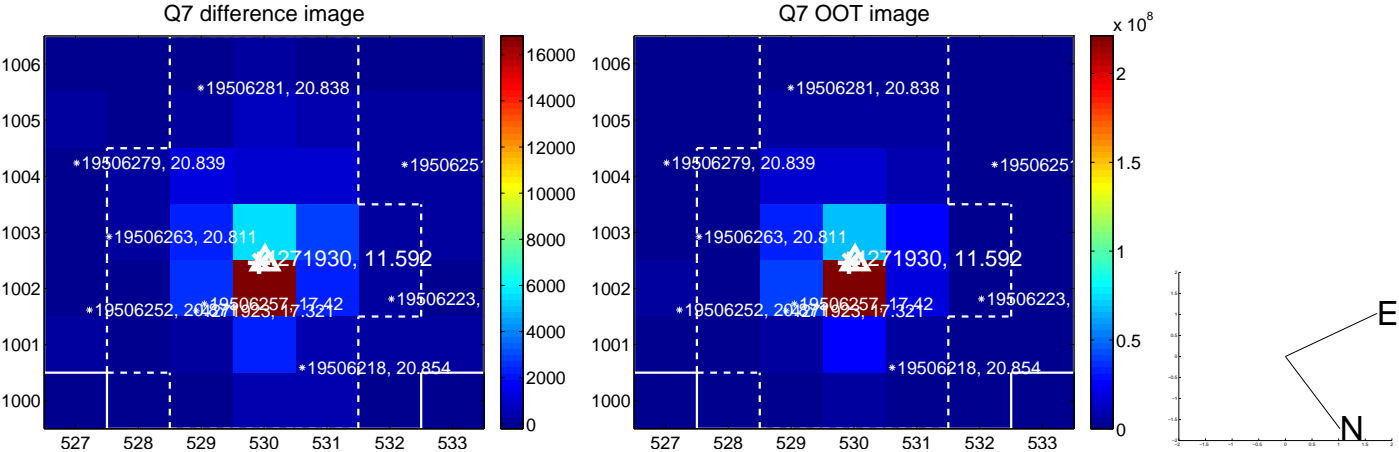
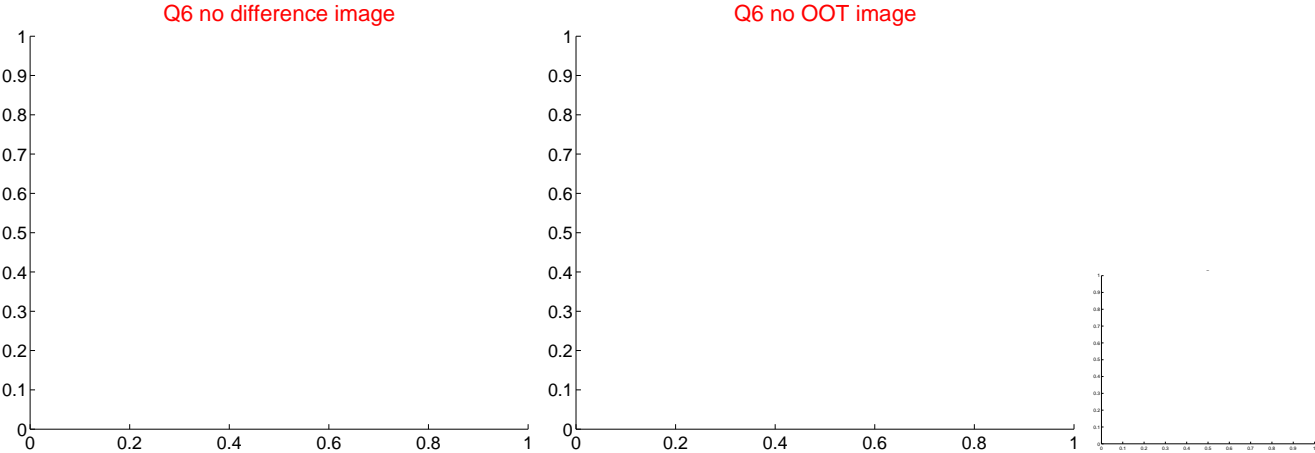
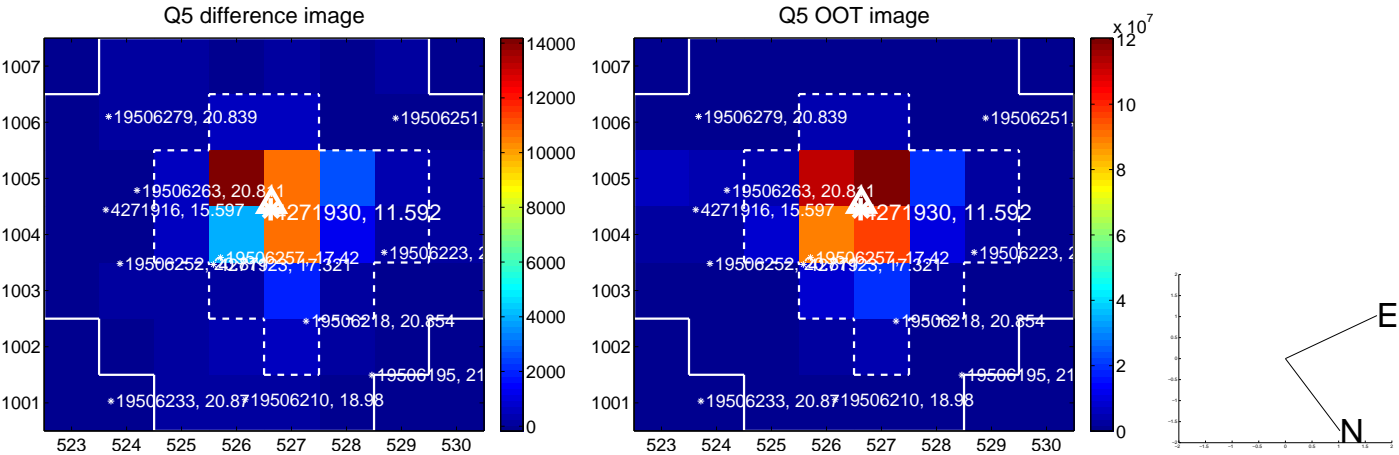


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

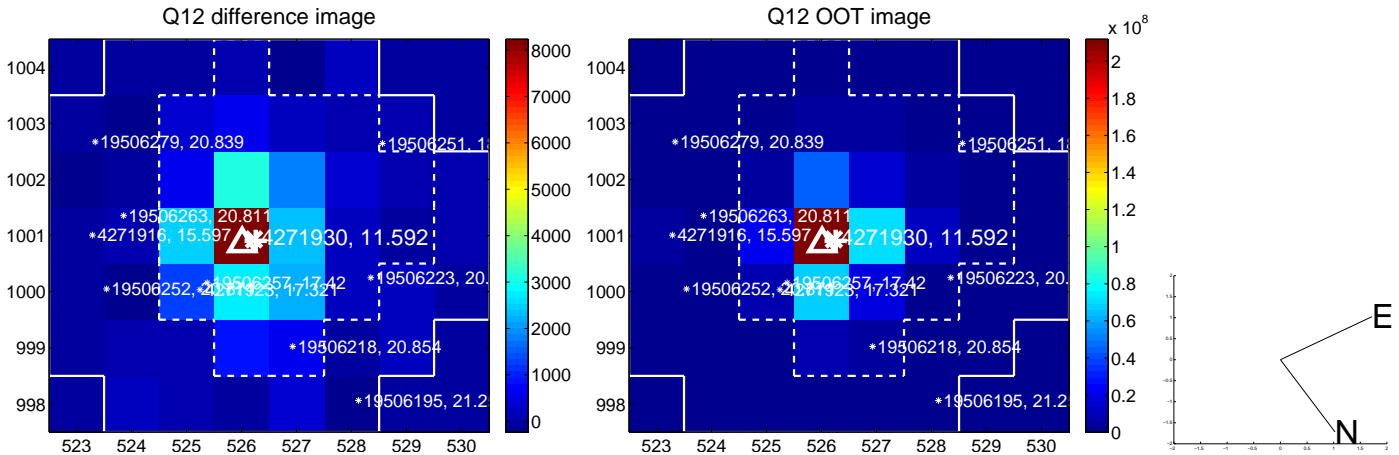
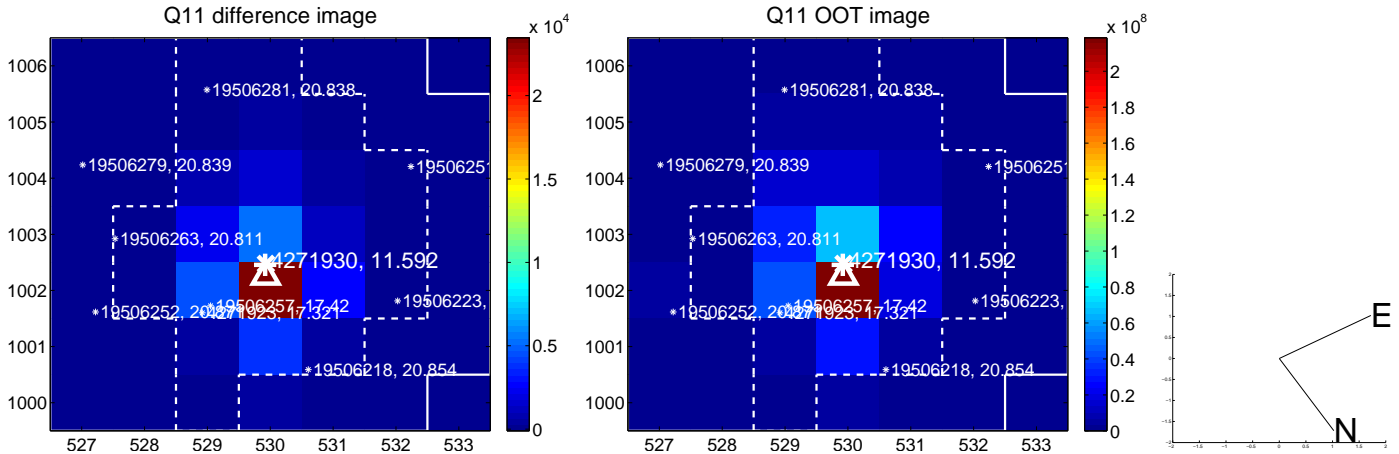
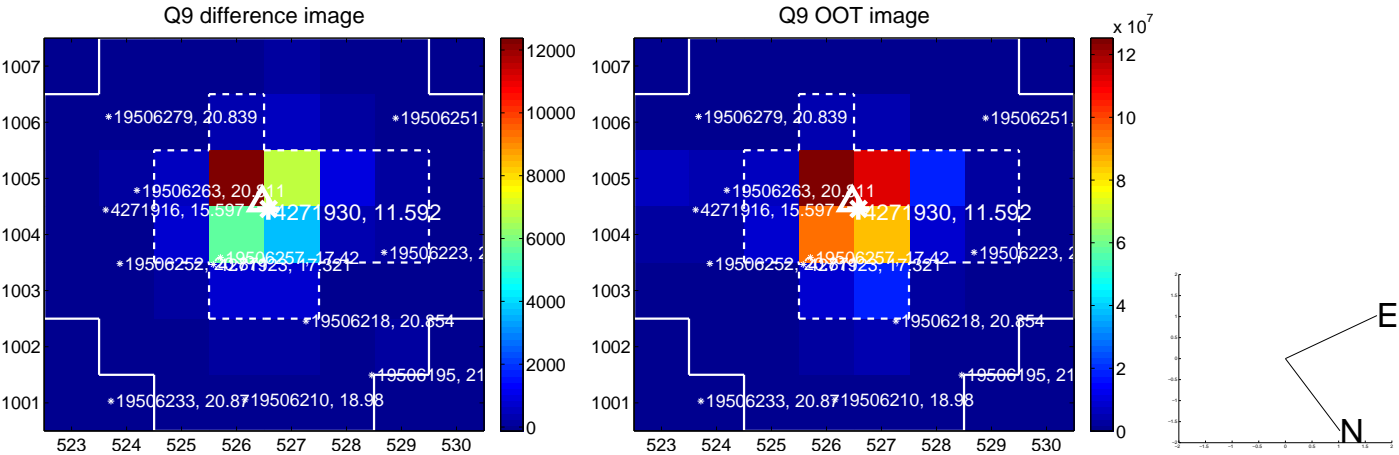
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



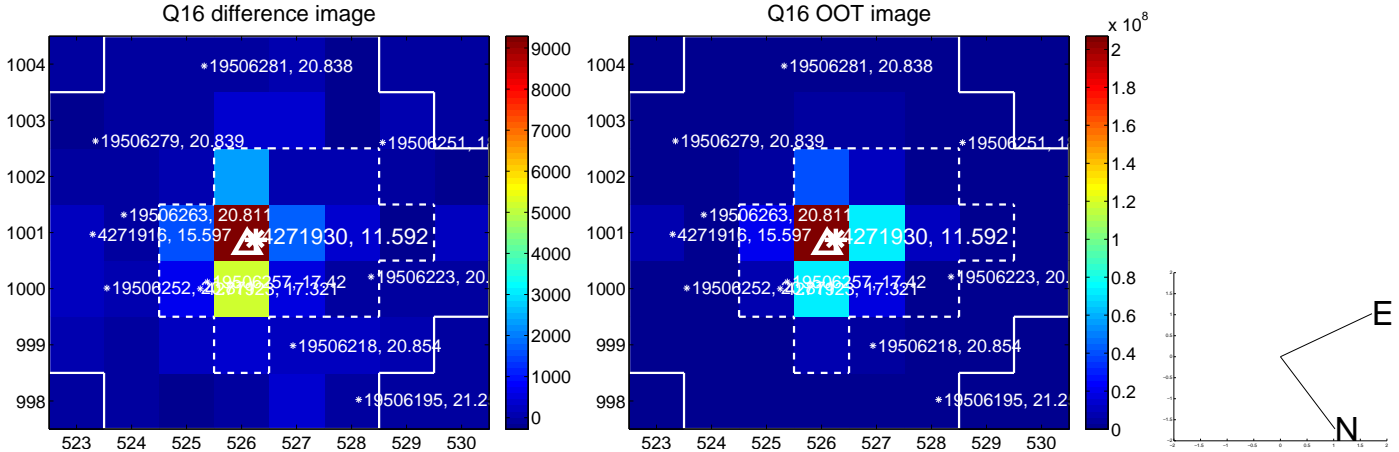
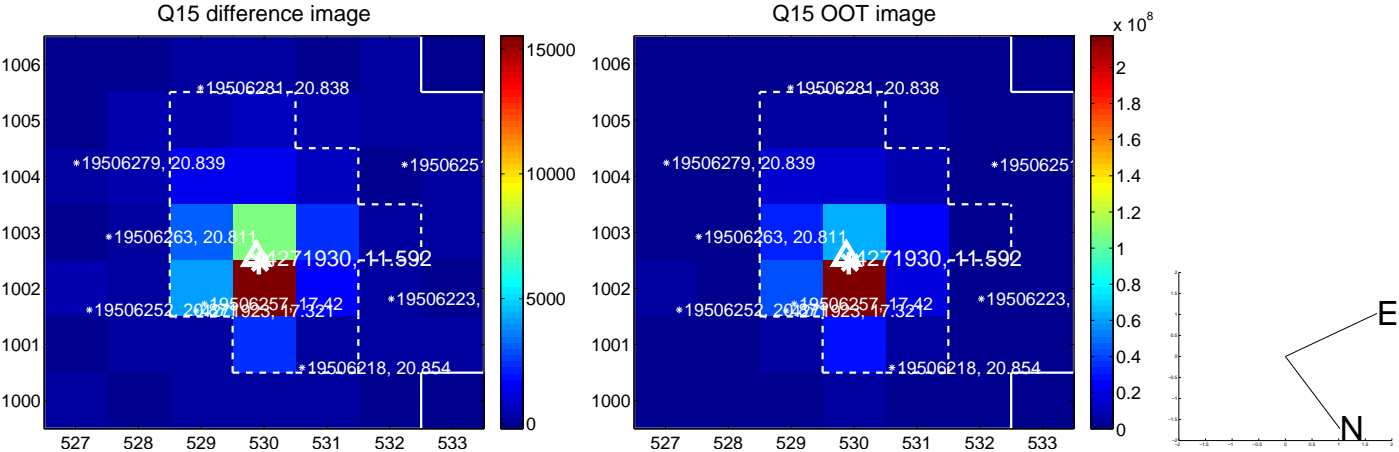
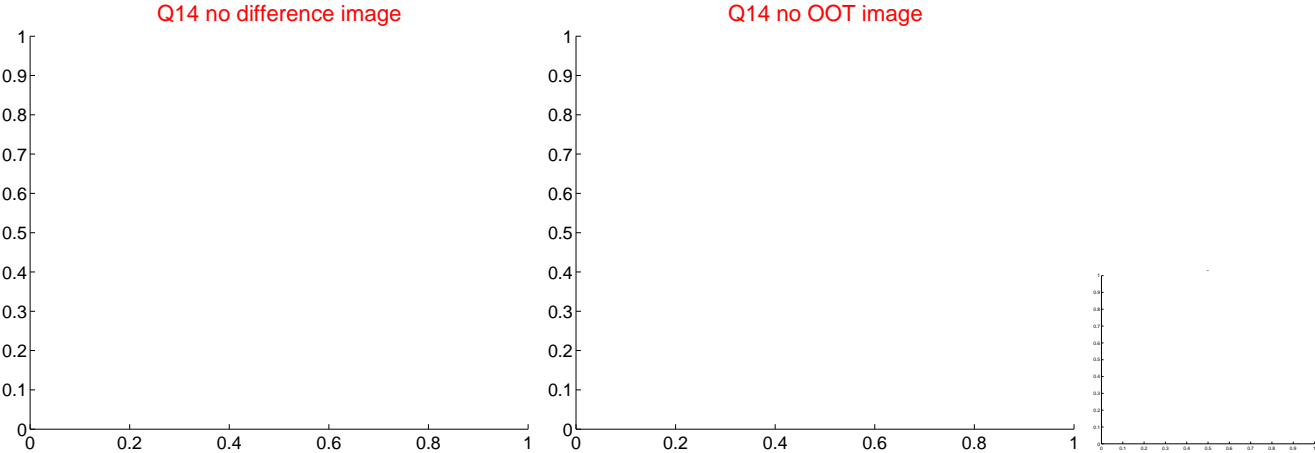
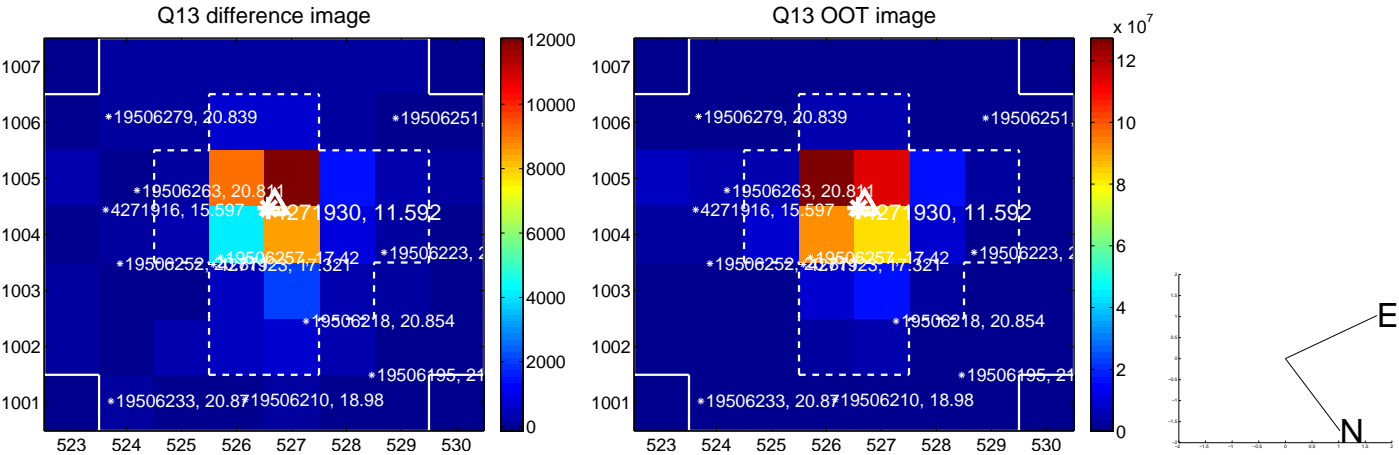
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



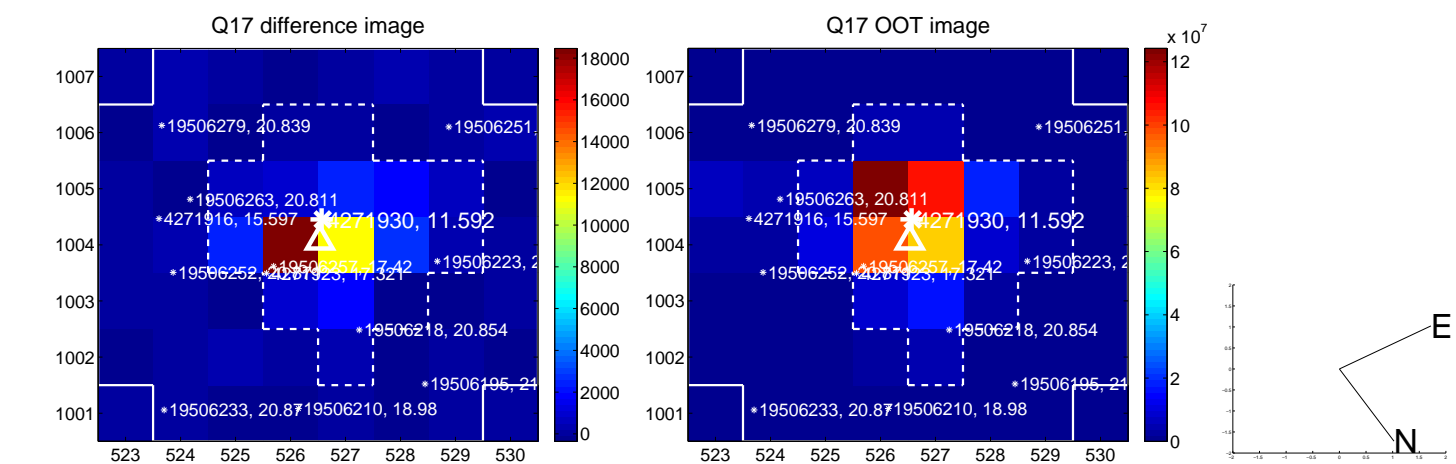
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



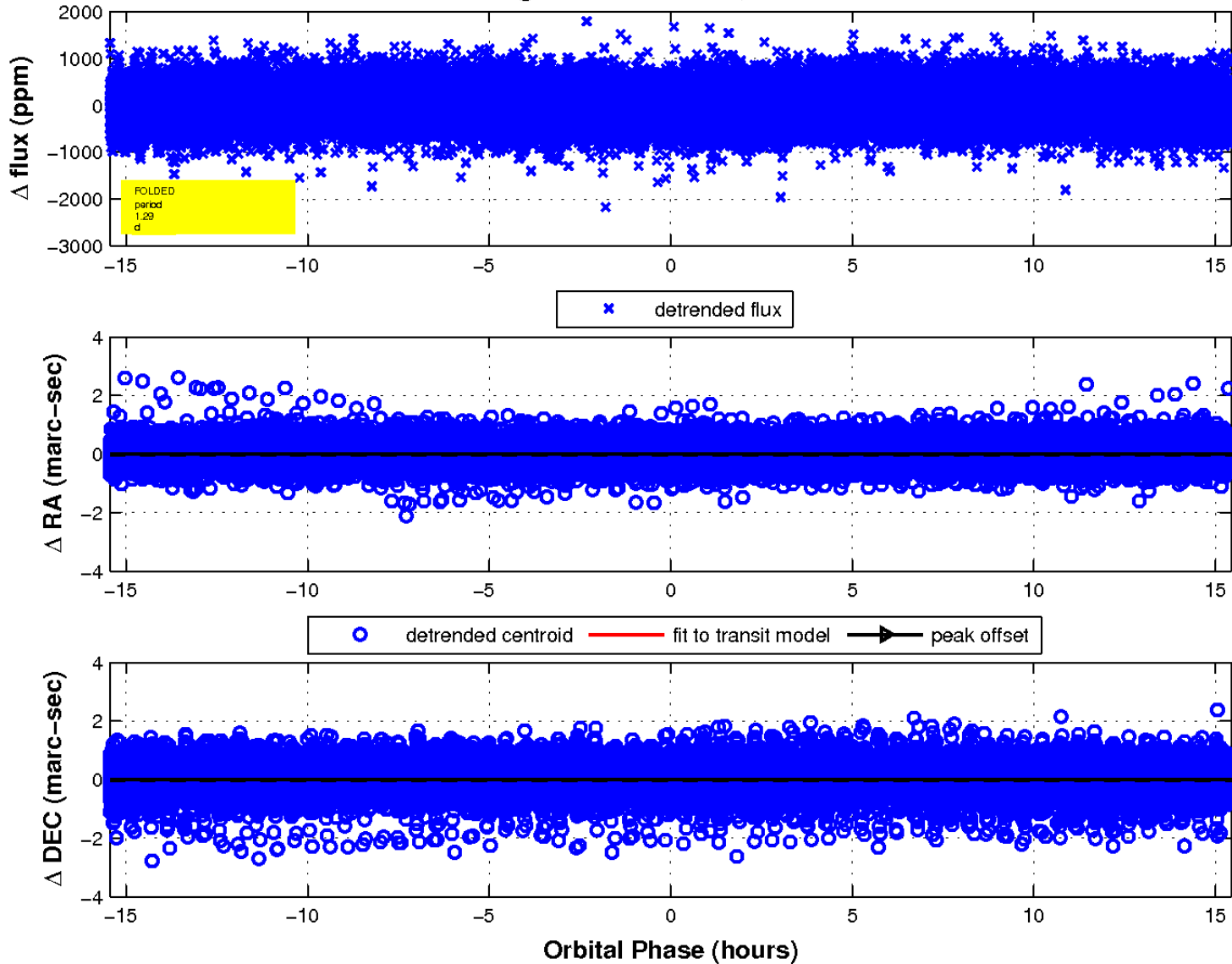
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

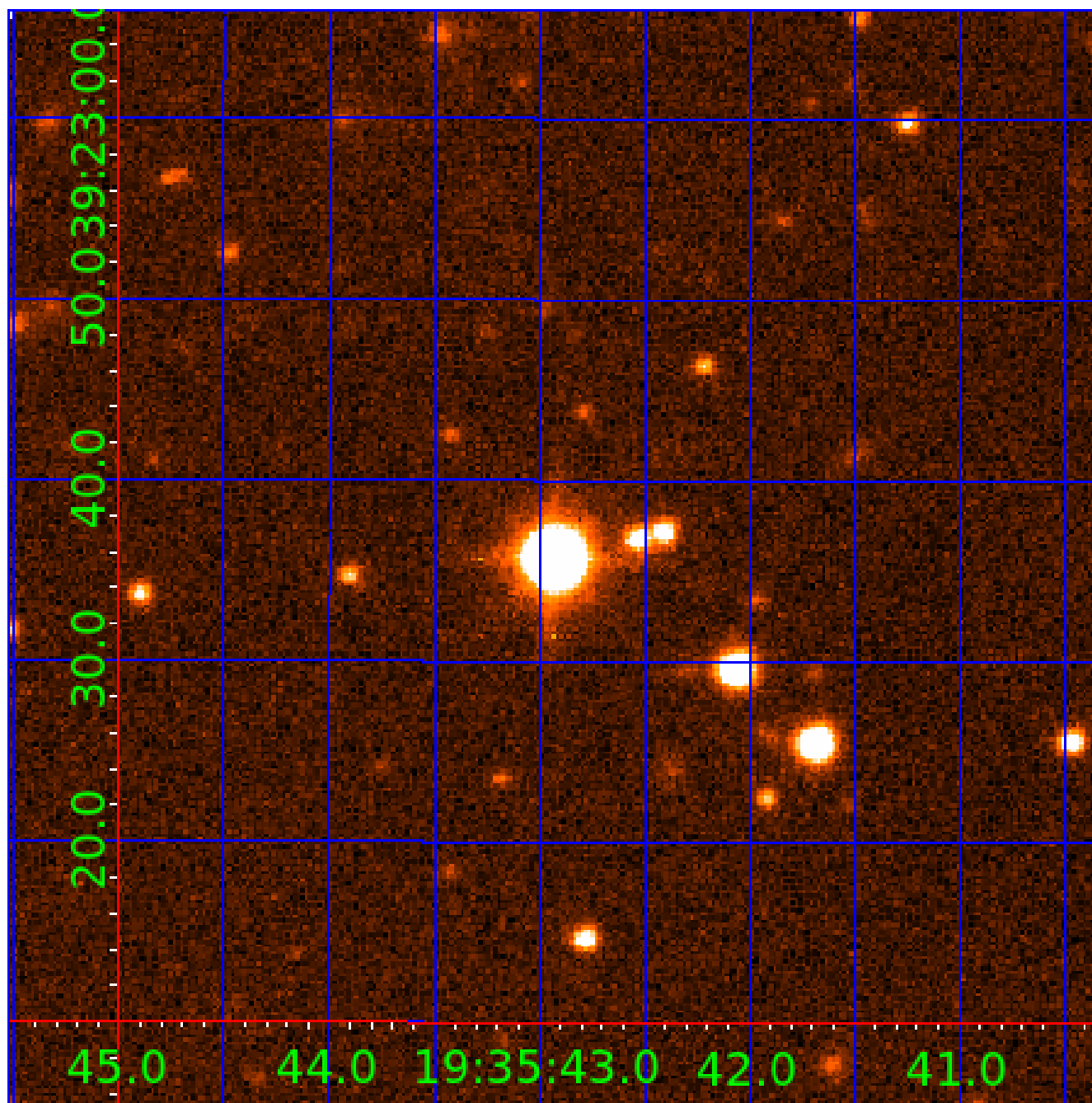


fluxWeightedCentroids, Planet 2 of 4



UKIRT Image

Declination



KIC 004271930

Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
004271930-01	OBS	No	0.892957	131.796601	33.8	3.268	10.9	8.4	1.73	8605	1.17	31841.11
004271930-02	OBS	No	1.287207	132.731536	51.2	6.278	10.1	10.8	1.73	8605	1.26	19553.81
004271930-03	OBS	No	0.595341	132.066106	64.4	2.806	9.1	10.6	1.73	8605	1.61	54669.06
004271930-04	OBS	No	26.289359	153.789839	465.2	3.389	7.9	11.6	1.73	8605	4.24	350.26

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004271930-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
004271930-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT
004271930-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT
004271930-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

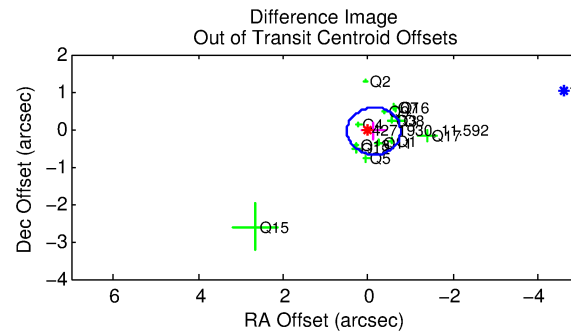
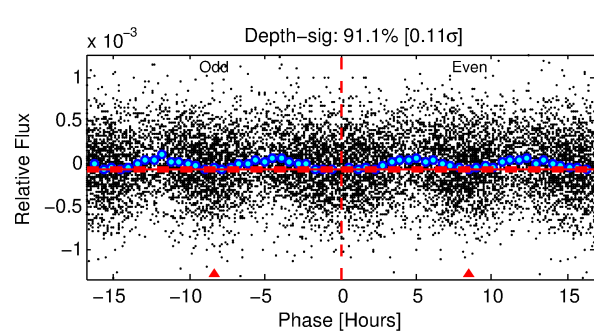
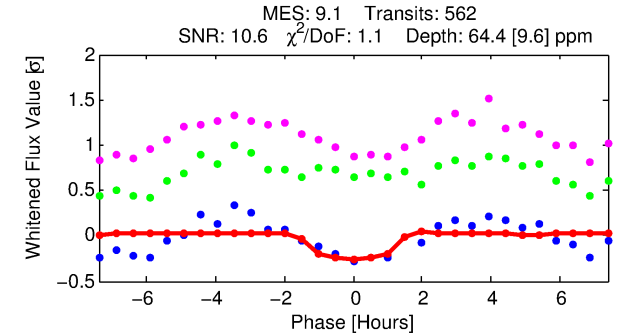
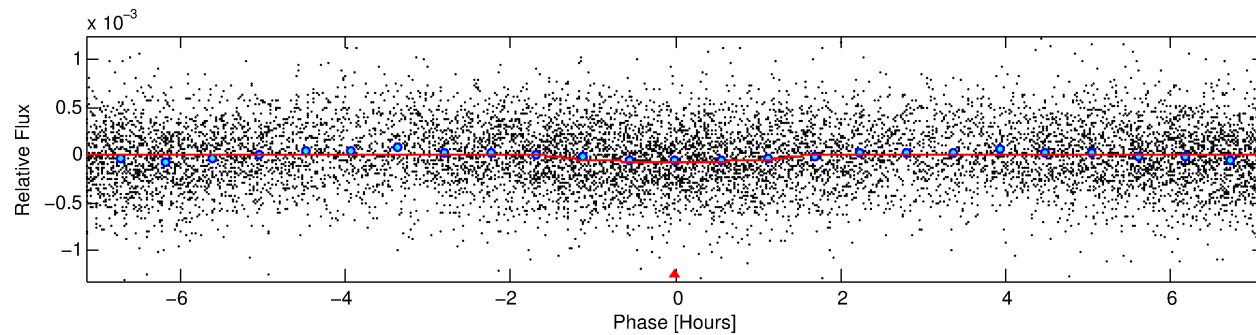
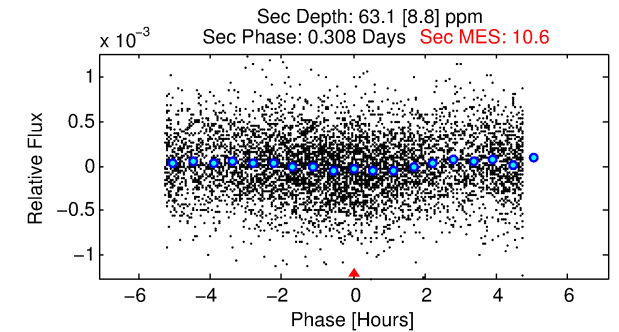
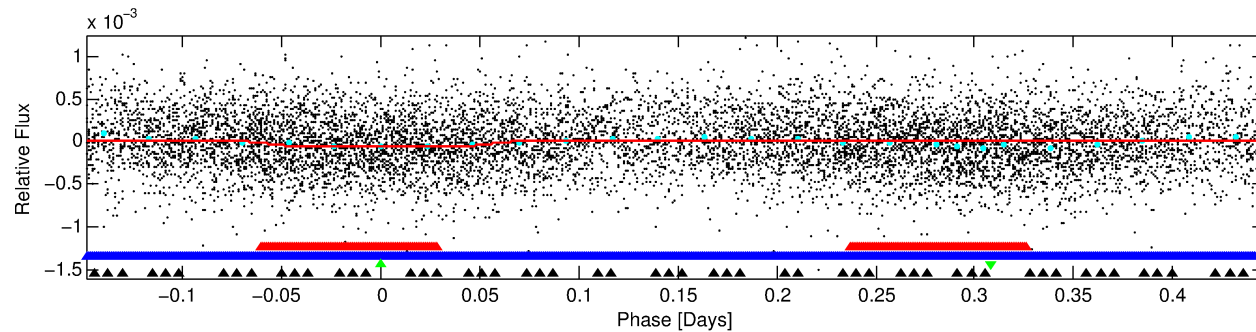
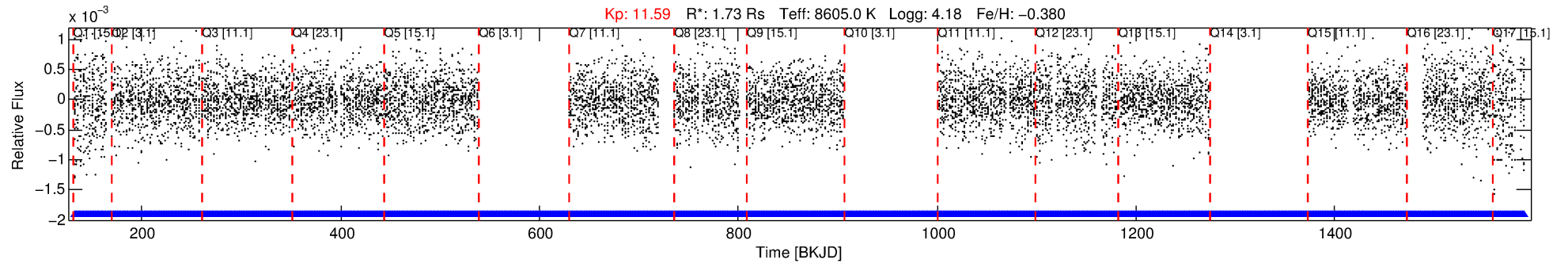
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004271930-03

No Significant Match Found

DV One-Page Summary

KIC: 4271930 Candidate: 3 of 4 Period: 0.595 d



DV Fit Results:

Period = 0.59534 [0.00001] d
Epoch = 132.0661 [0.0039] BKJD
Rp/R* = 0.0085 [0.0054]
a/R* = 1.20 [1.53]
b = 0.90 [0.92]
Seff = 54669.06 [9369.27]
Teq = 3899 [167] K
Rp = 1.61 [1.05] Re
a = 0.0164 [0.0019] AU
Ag = 3.61 [4.65] [0.56σ]
Teffp = 8307 [2656] K [1.66σ]

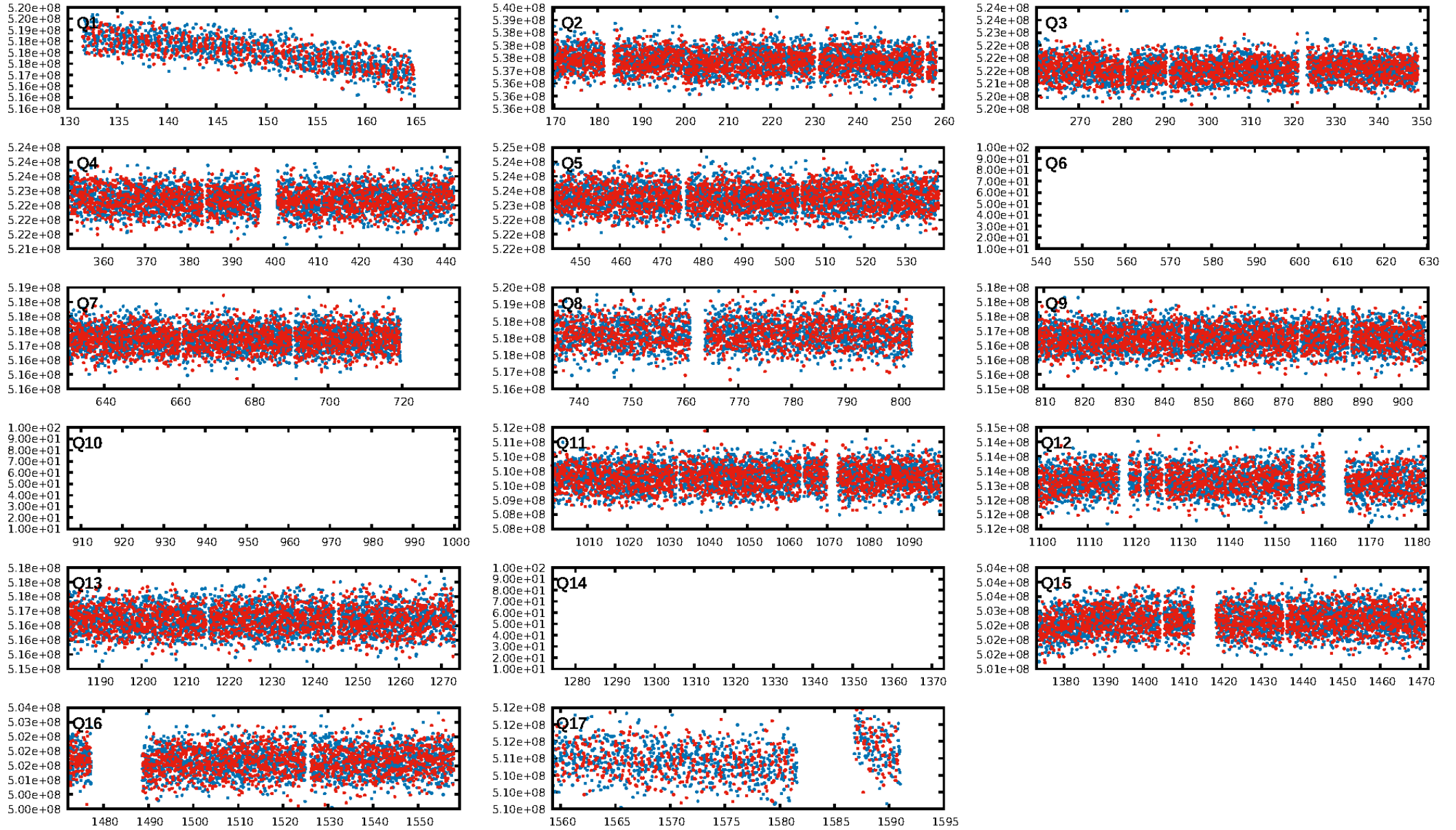
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 90.3% [1.66σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 6.84e-01
RollingBand-fgt: 1.00 [532/532]
GhostDiagnostic-chr: 2.062
Centroid-sig: 4.7%
Centroid-so: 0.172 arcsec [1.21σ]
OotOffset-rm: 0.150 arcsec [0.72σ]
KicOffset-rm: 0.175 arcsec [0.78σ]
OotOffset-st: 1/4/4/5 [14]
KicOffset-st: 1/4/4/5 [14]
DiffImageQuality-fgm: 0.93 [13/14]
DiffImageOverlap-fno: 0.00 [0/14]

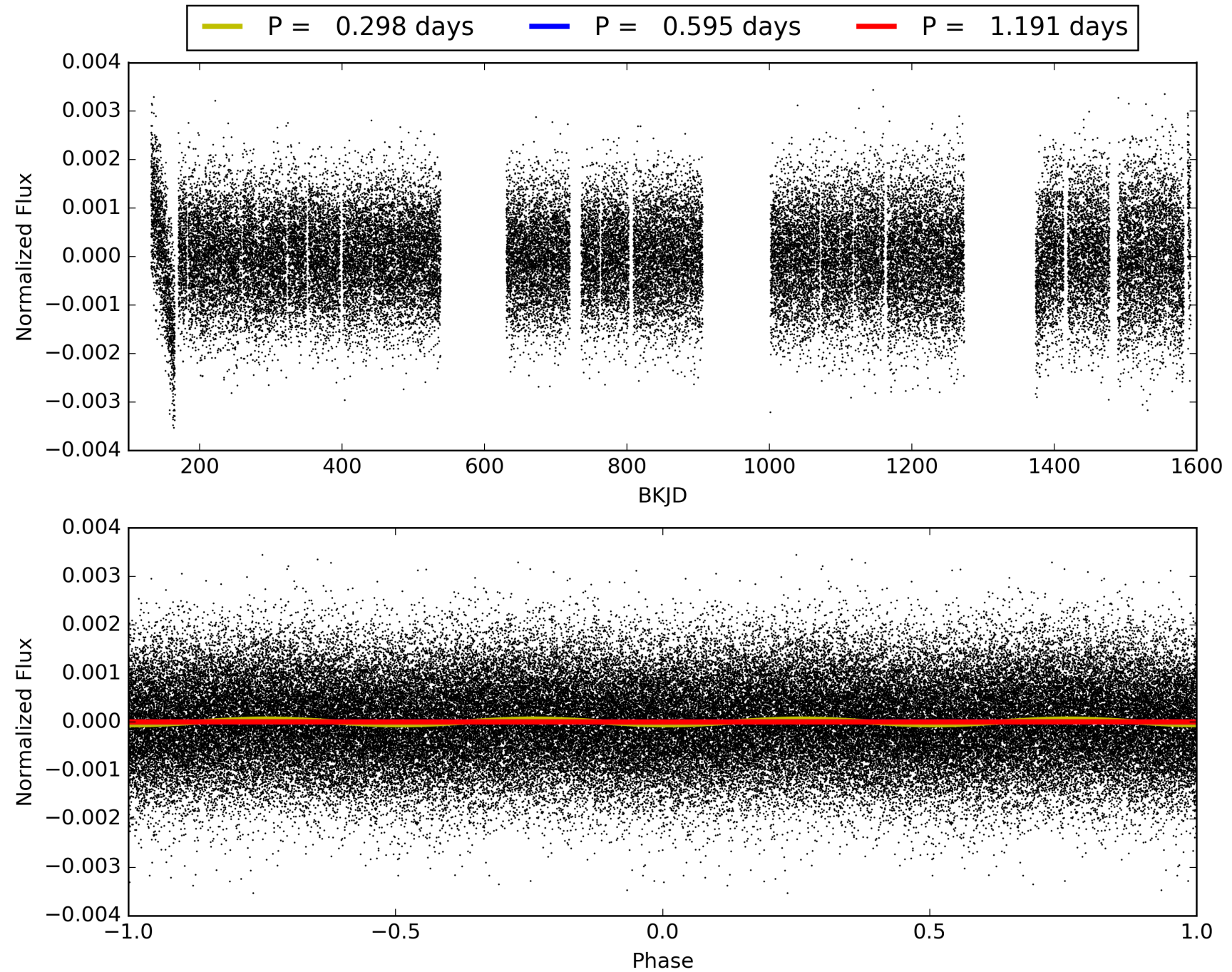
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 04:57:18 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 004271930-03, PDC Light Curves

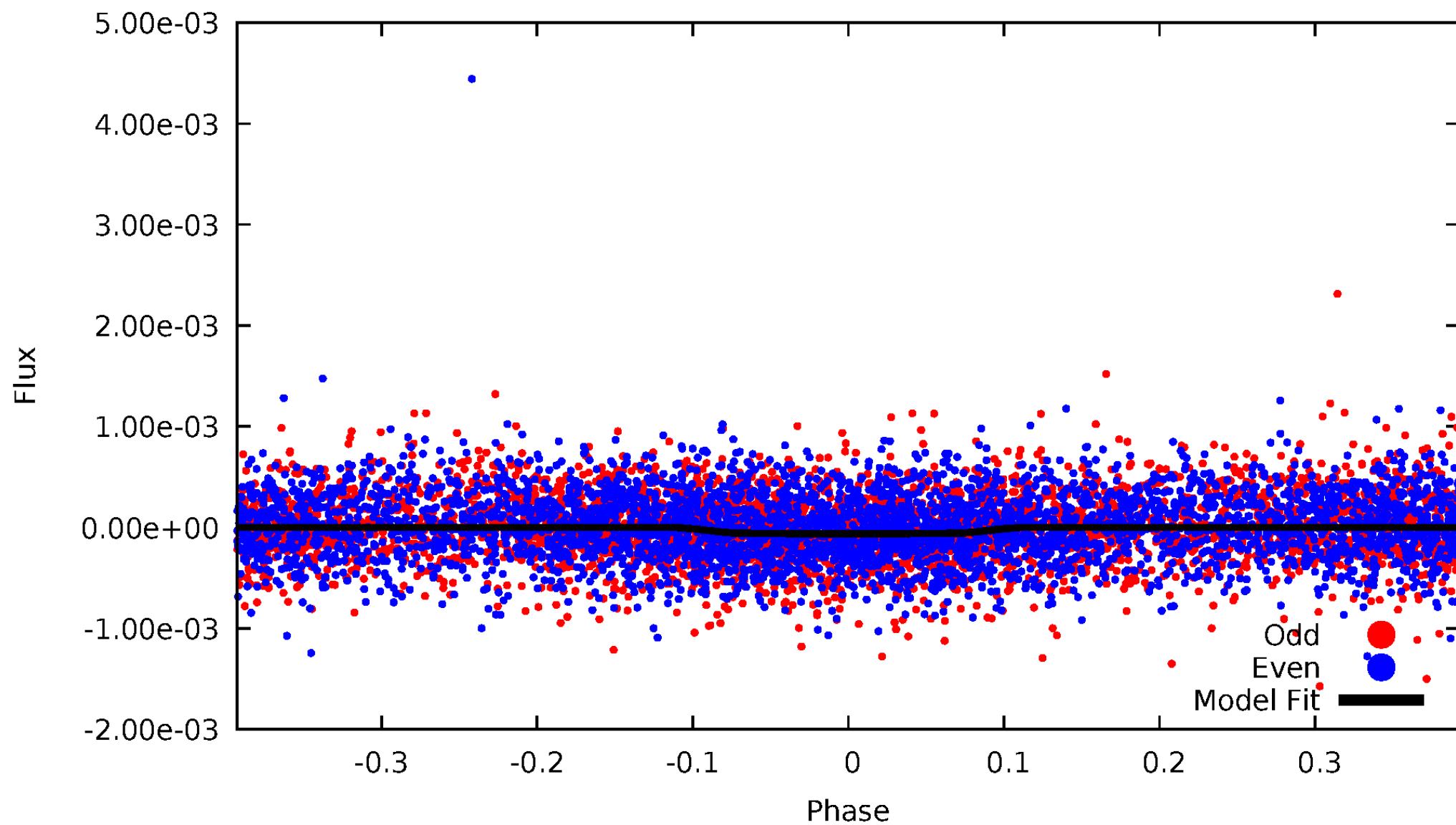


TCE 004271930-03



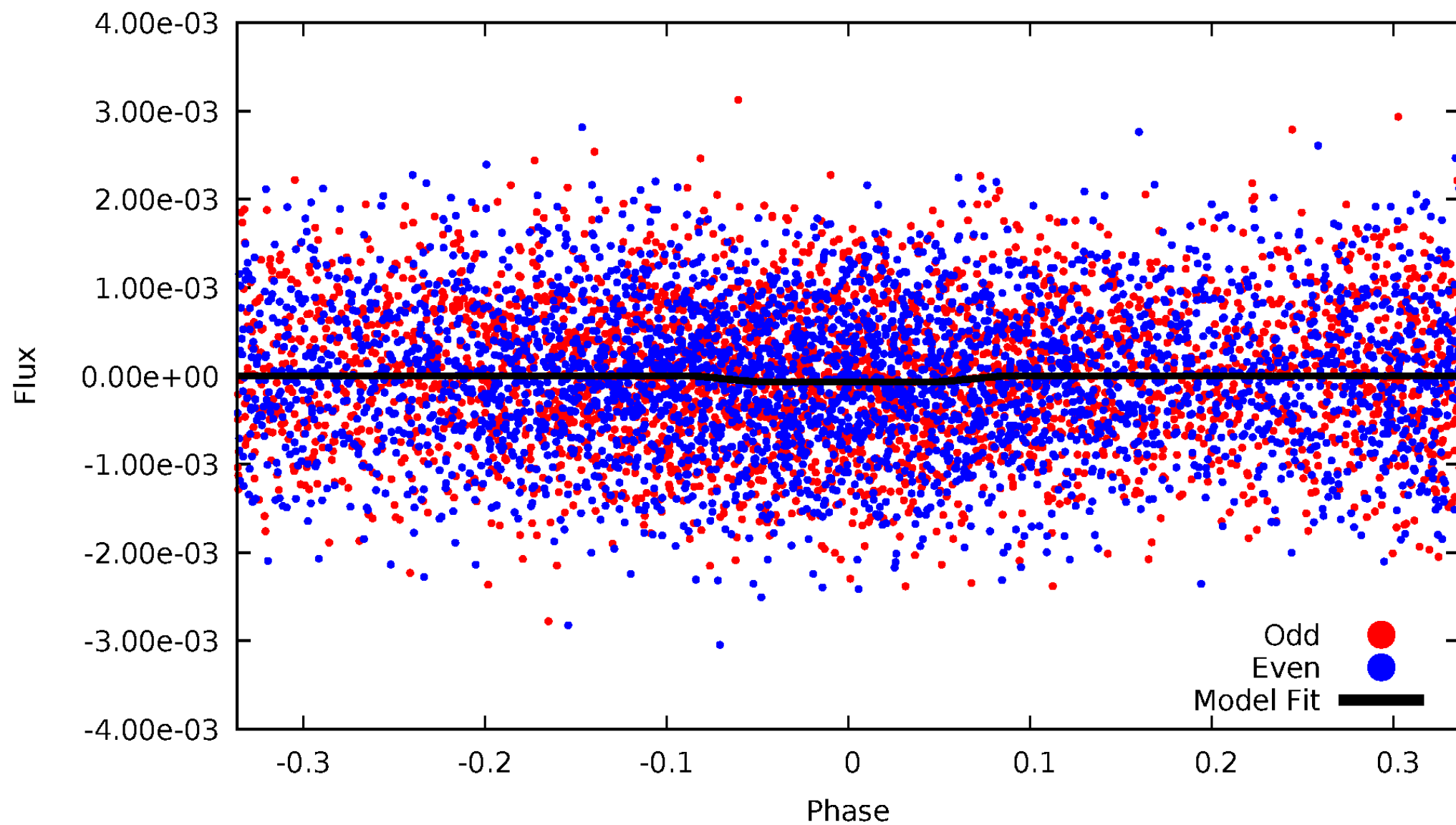
DV Odd/Even

TCE 004271930-03



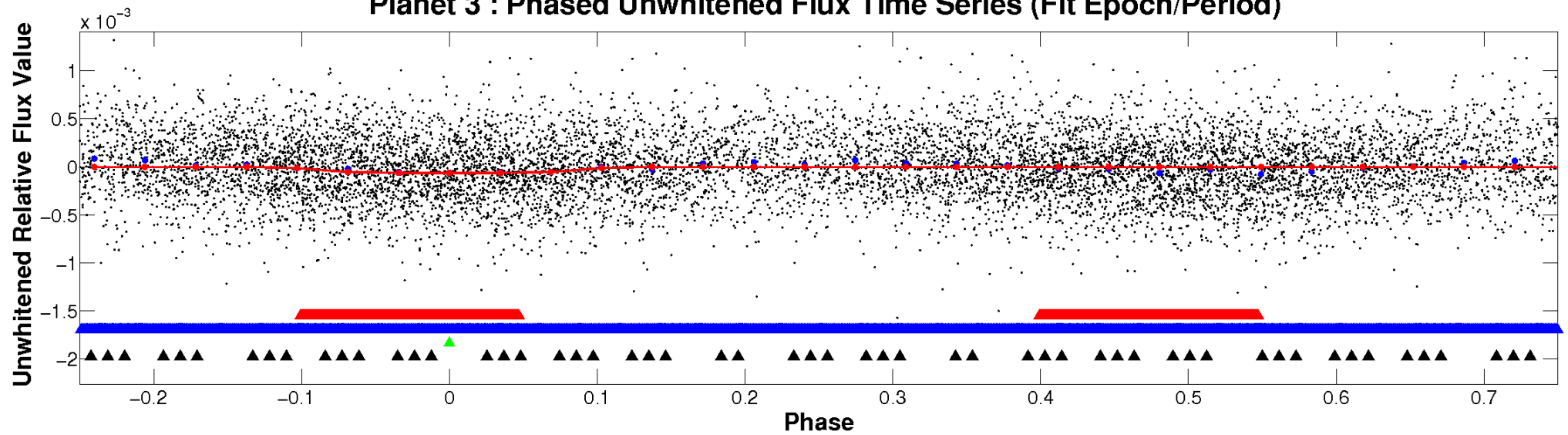
ALT Odd/Even

TCE 004271930-03

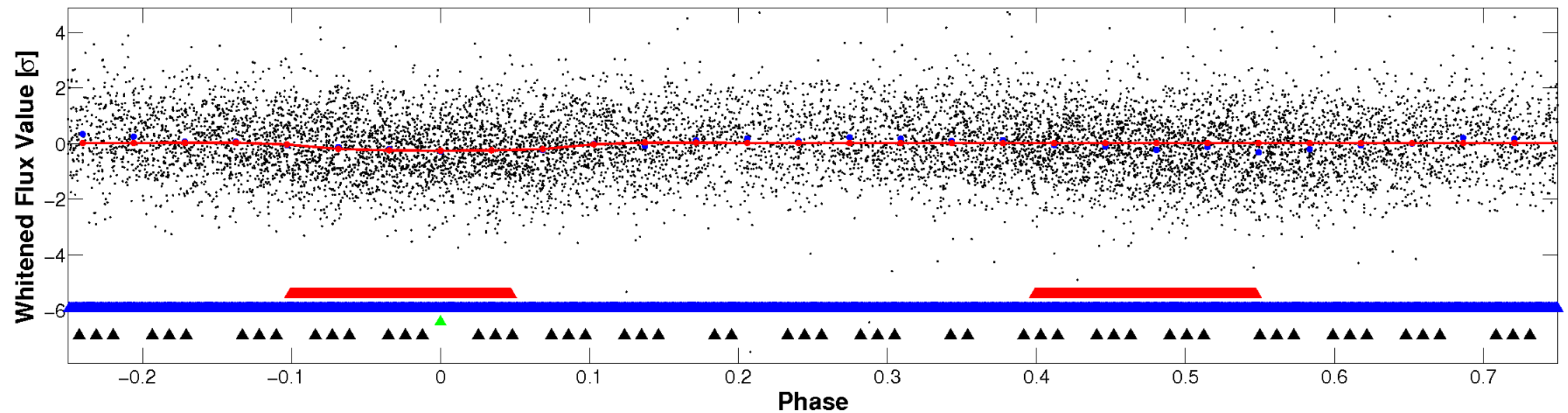


Non-Whitened Vs. Whitened Light Curve

Planet 3 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

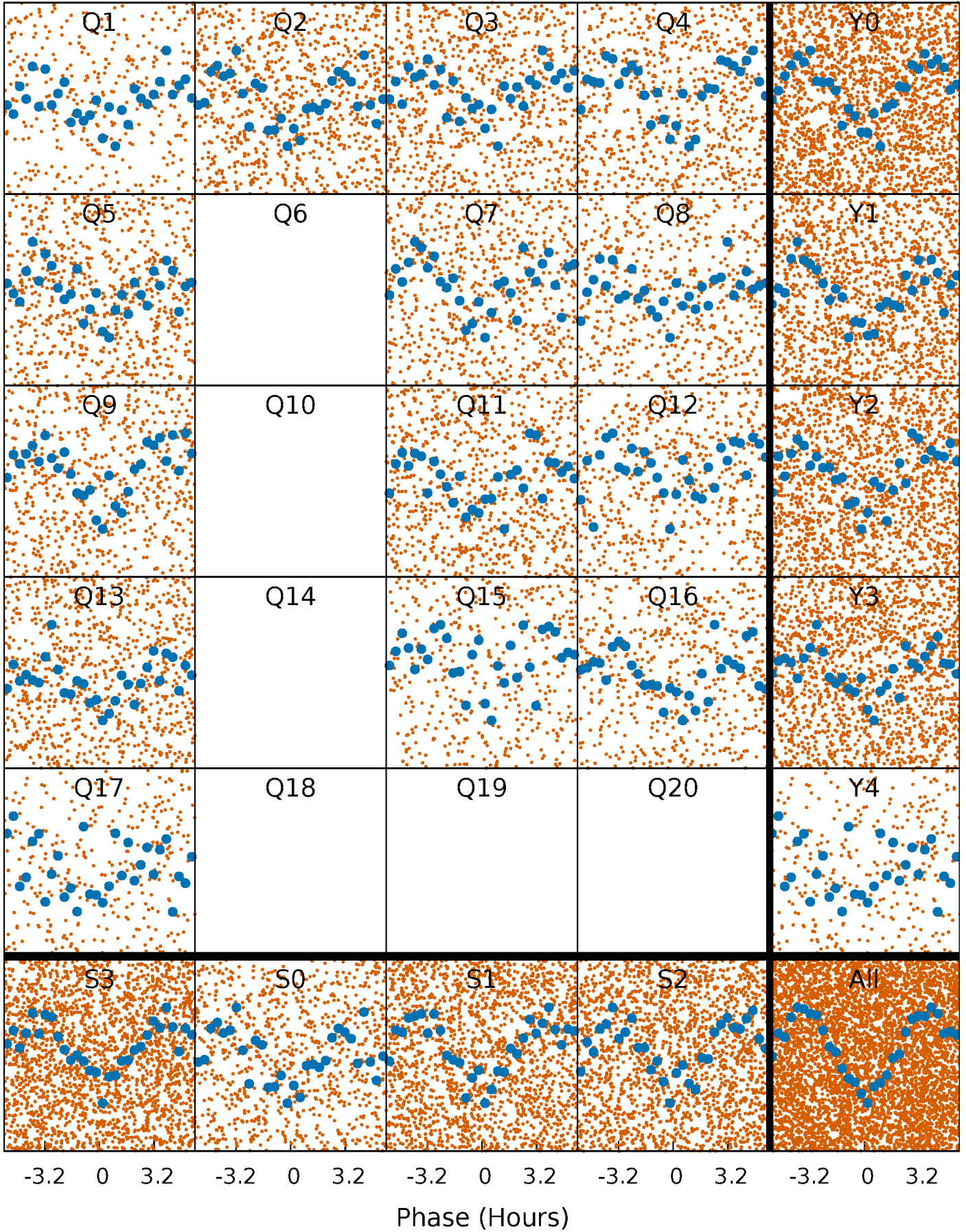


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



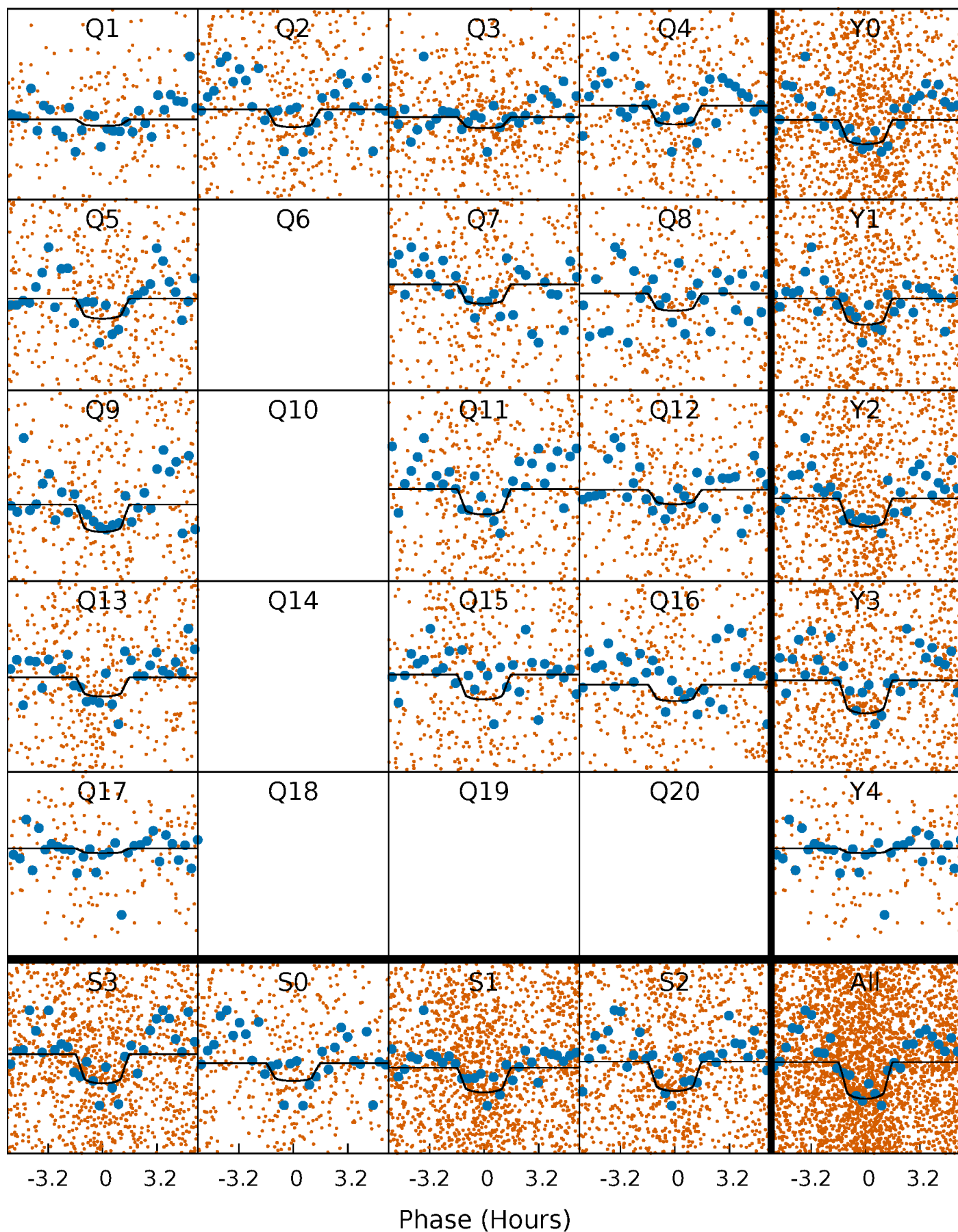
PDC Quarter-Phased Transit Curves

TCE 004271930-03 P= 0.595341 Days $T_0=132.066106$ (BKJD)



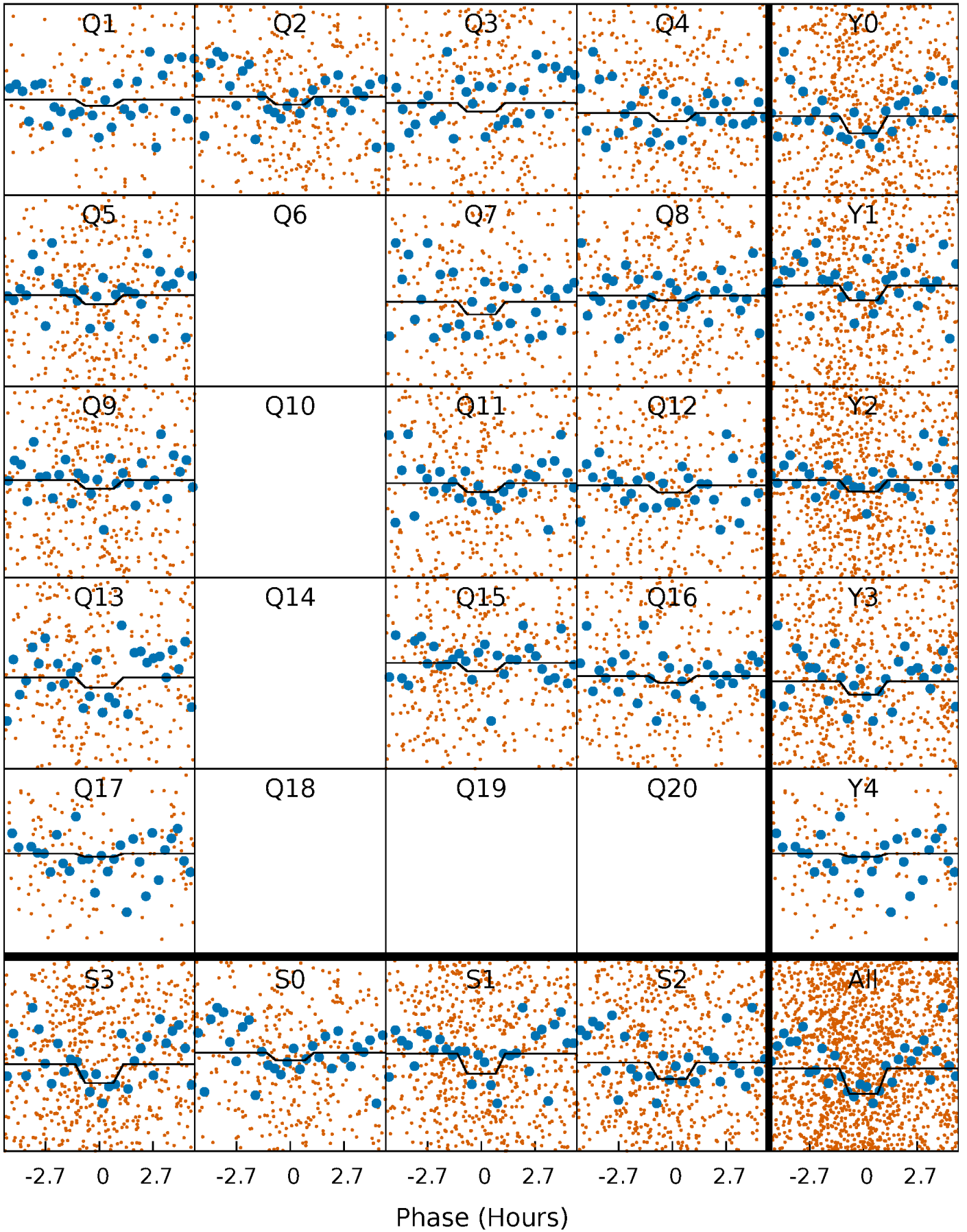
DV Quarter-Phased Transit Curves

TCE 004271930-03 P= 0.595341 Days $T_0=132.066106$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

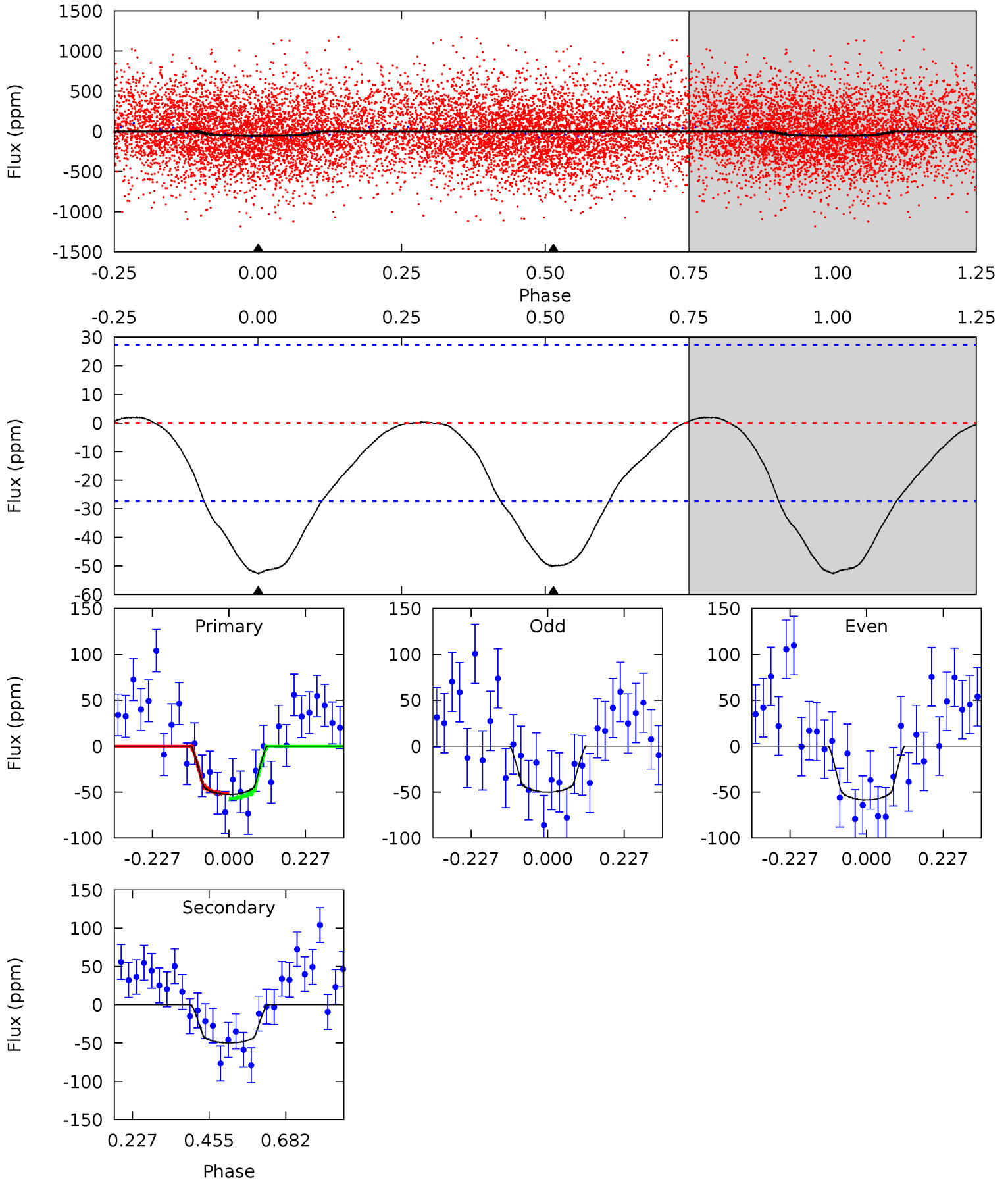
TCE 004271930-03 P= 0.595342 Days $T_0=132.071110$ (BKJD)



DV Model-Shift Uniqueness Test

004271930-03, P = 0.595341 Days, E = 131.470765 Days

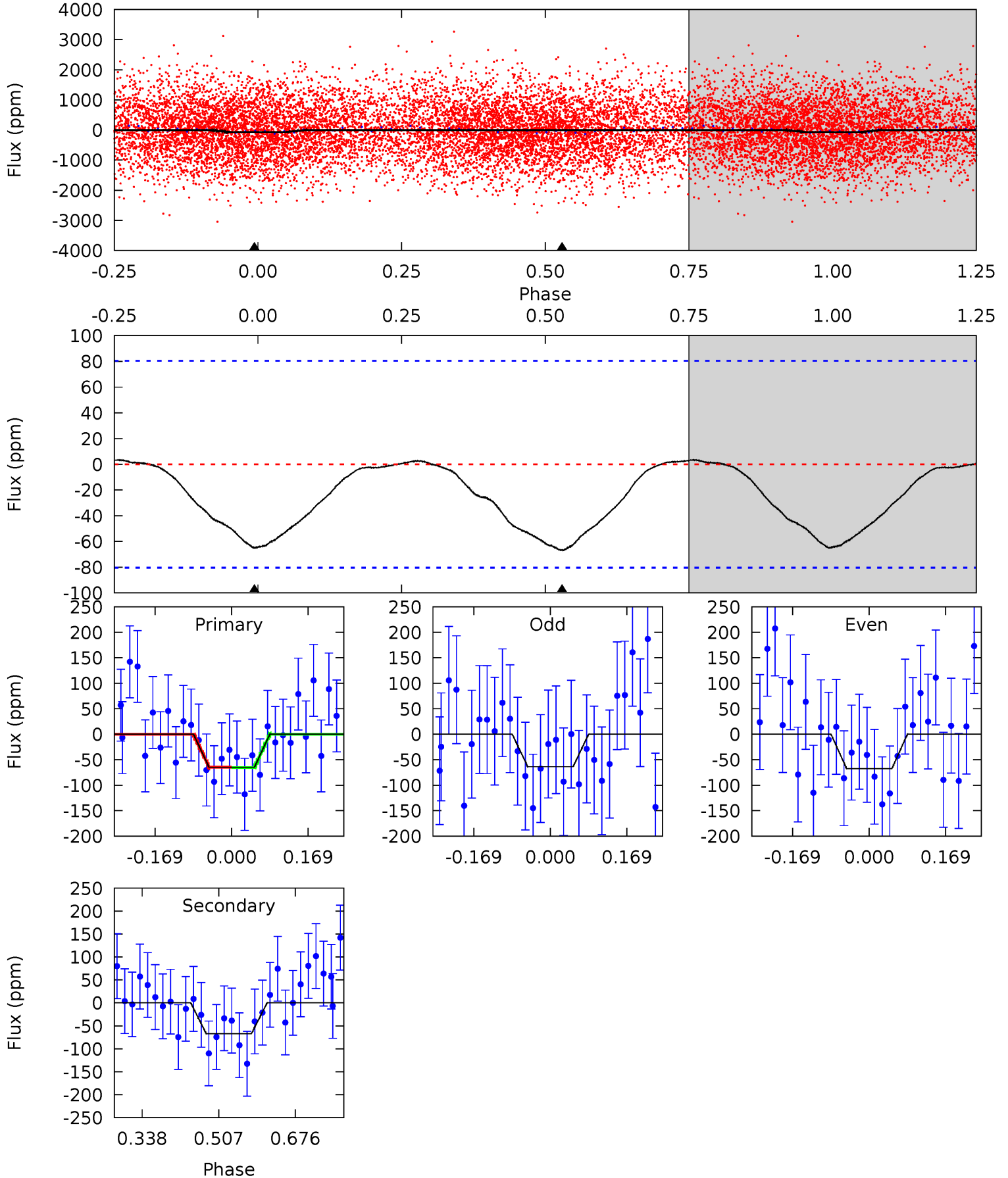
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.44	8.02	0	0	4.39	1.21	0.25	8.44	8.44	8.02	8.02	0.69	0.87	0.04	0.42



Alt Model-Shift Uniqueness Test

004271930-03, P = 0.595342 Days, E = 131.475768 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.60	3.70	0	0	4.45	1.38	0.21	3.60	3.60	3.70	3.70	0.10	0.98	0.05	0.02



Stellar Parameters For KIC 004271930

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	8605^{+77}_{-86}	$4.182^{+0.090}_{-0.090}$	$-0.380^{+0.050}_{-0.150}$	$1.731^{+0.242}_{-0.242}$	$1.660^{+0.081}_{-0.128}$	$0.451^{+0.187}_{-0.132}$
	+1%/-1%	+2%/-2%	+13%/-39%	+14%/-14%	+5%/-8%	+41%/-29%
Source	SPE68	SPE68	SPE68	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 004271930-03 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-50 ± 6	$1.67^{+1.03}_{-0.95}$	5452^{+200}_{-169}	7208^{+6402}_{-1850}	$2.656^{+11.537}_{-1.646}$
Alt.	-67 ± 18	$1.69^{+1.01}_{-0.91}$	5448^{+188}_{-175}	7911^{+6372}_{-2135}	$3.489^{+12.048}_{-2.228}$

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{\text{obs}} \gg T_{\text{max}}$ AND $A_{\text{obs}} \gg 1.0$

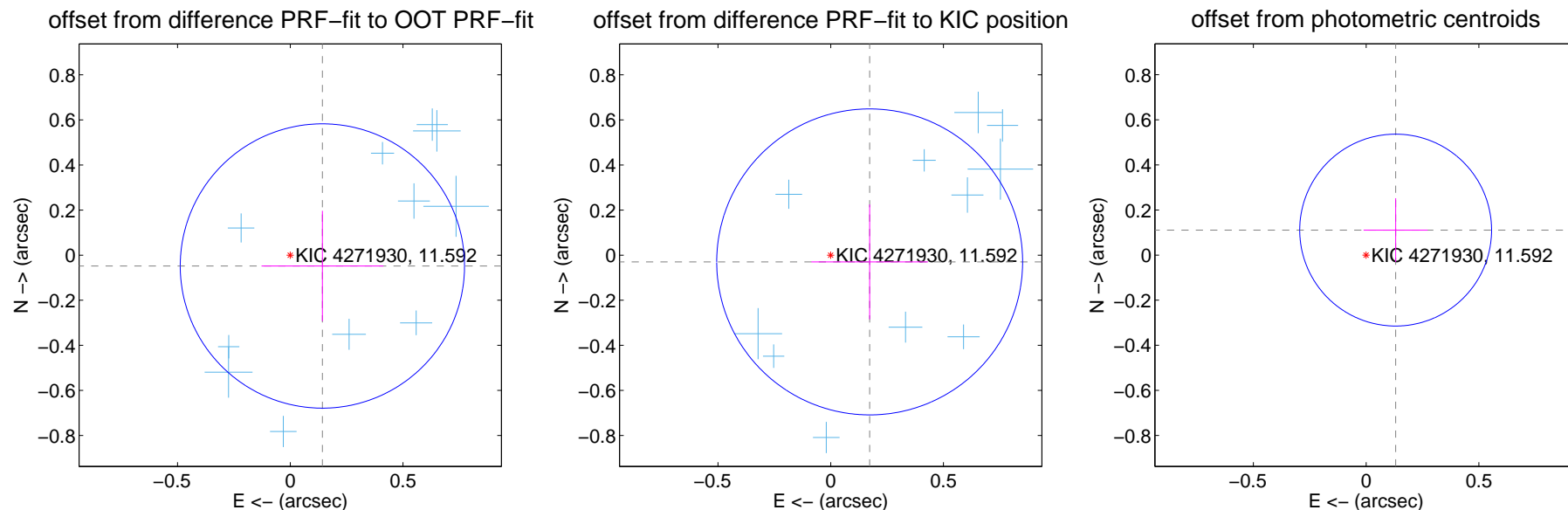
DV Centroid Data

Supplemental centroid analysis for 004271930-03. **Kepler magnitude: 11.59.** Transit SNR 10.63

There are 13 quarters with good PRF difference image offsets

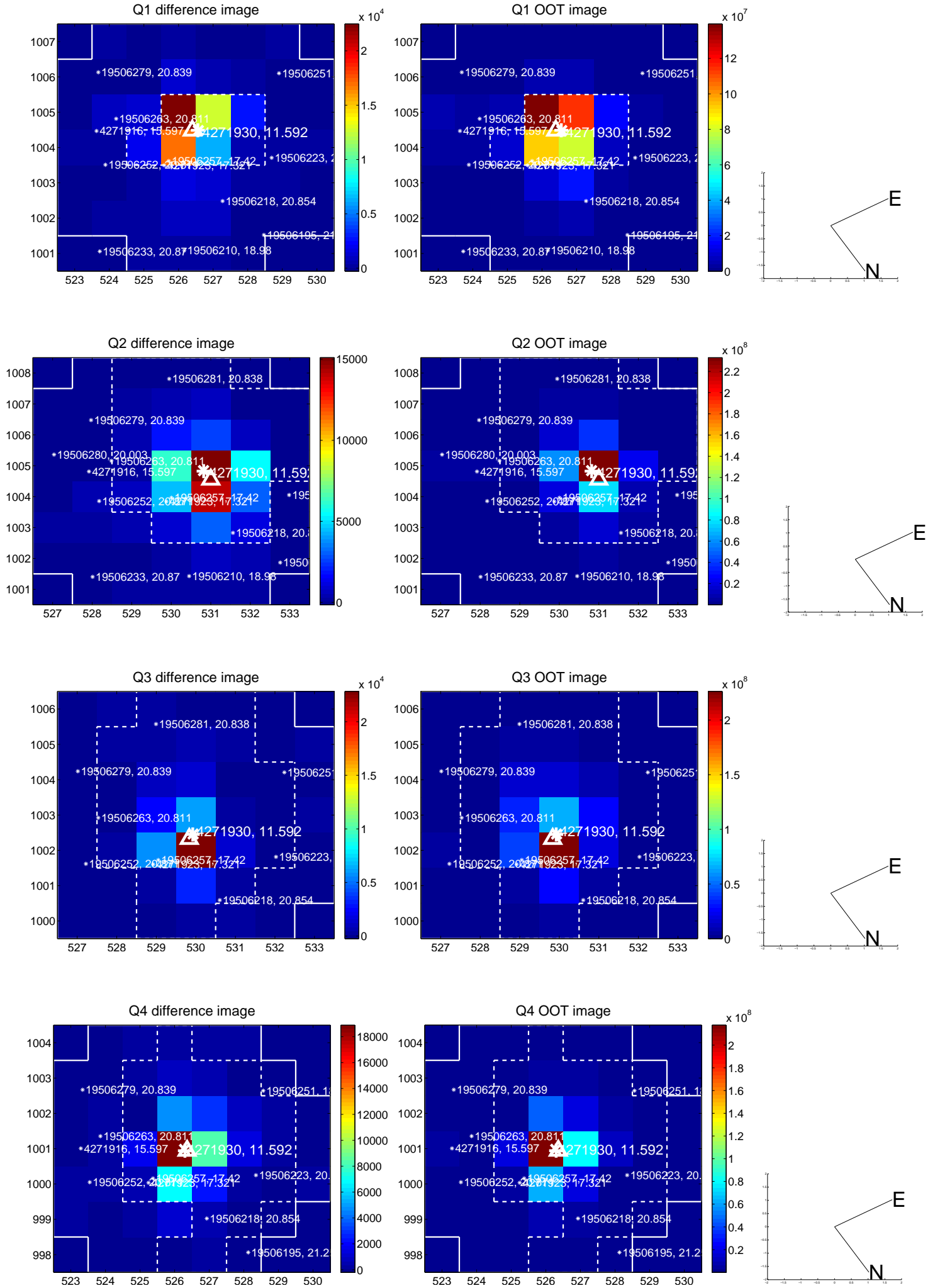
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.150 ± 0.210	0.72	-0.143 ± 0.270	-0.048 ± 0.245
PRF-fit source offset from KIC position	0.175 ± 0.226	0.78	-0.173 ± 0.259	-0.030 ± 0.255
photometric centroid source offset	0.17 ± 0.14	1.21	-0.13 ± 0.14	0.11 ± 0.14

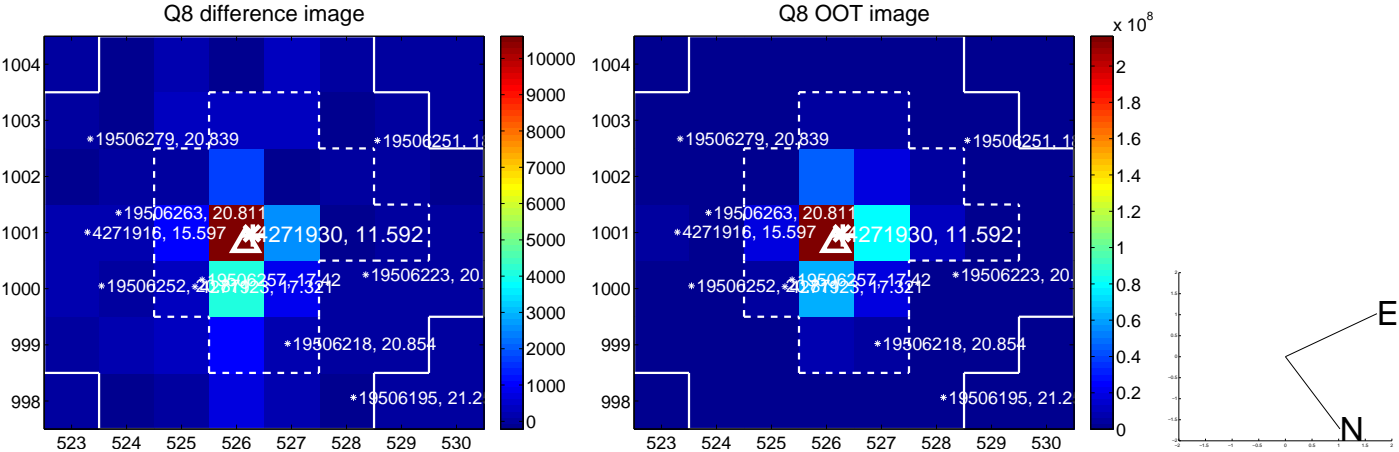
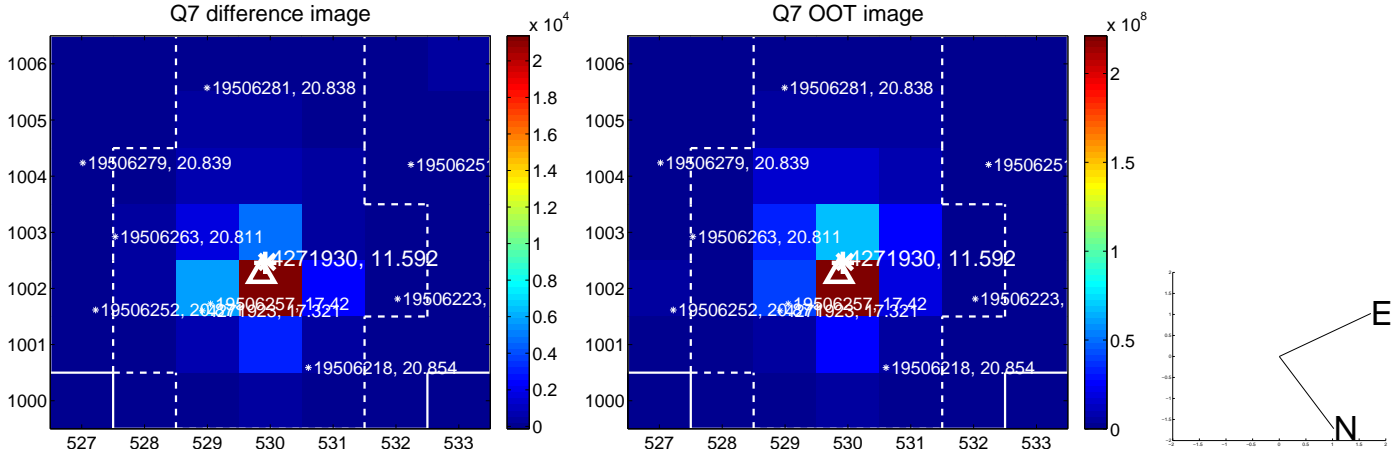
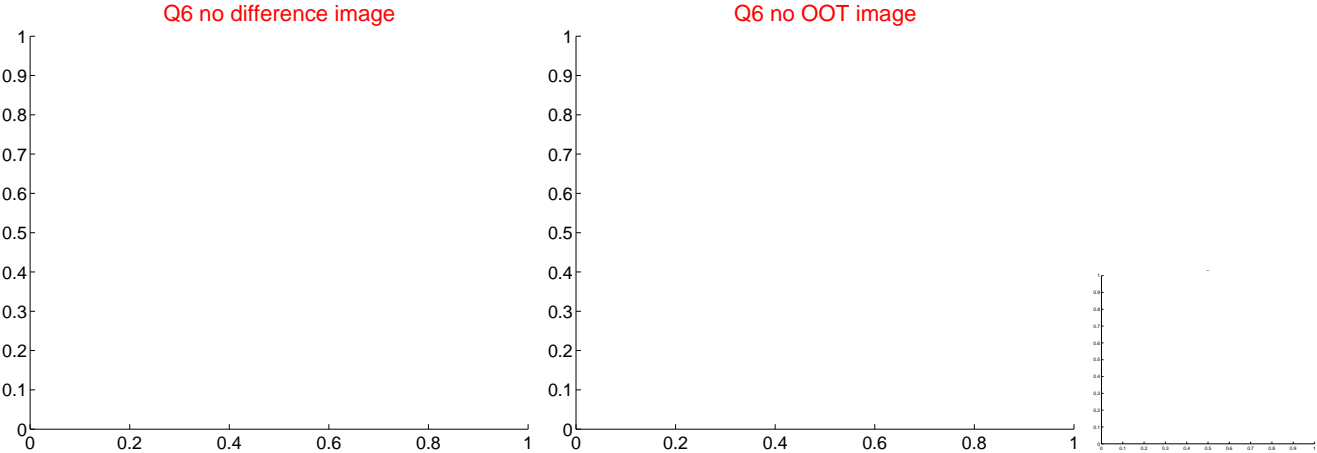
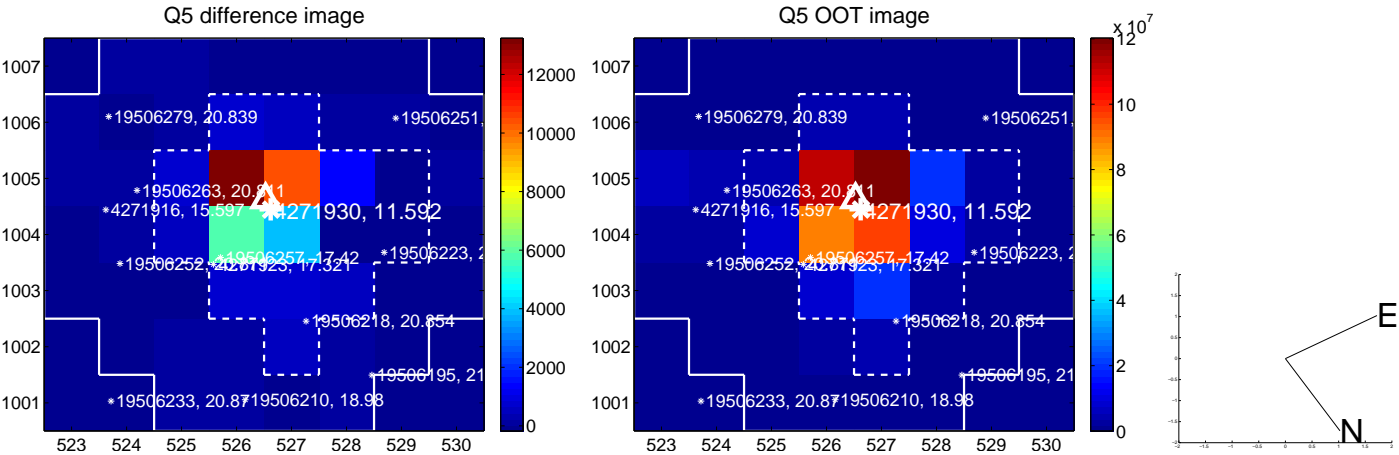


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

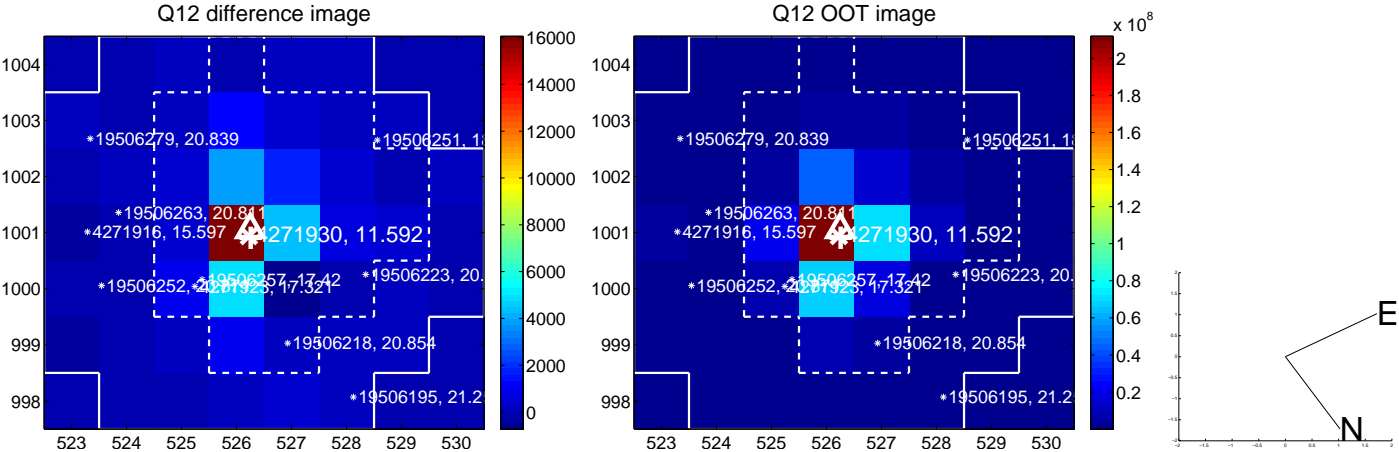
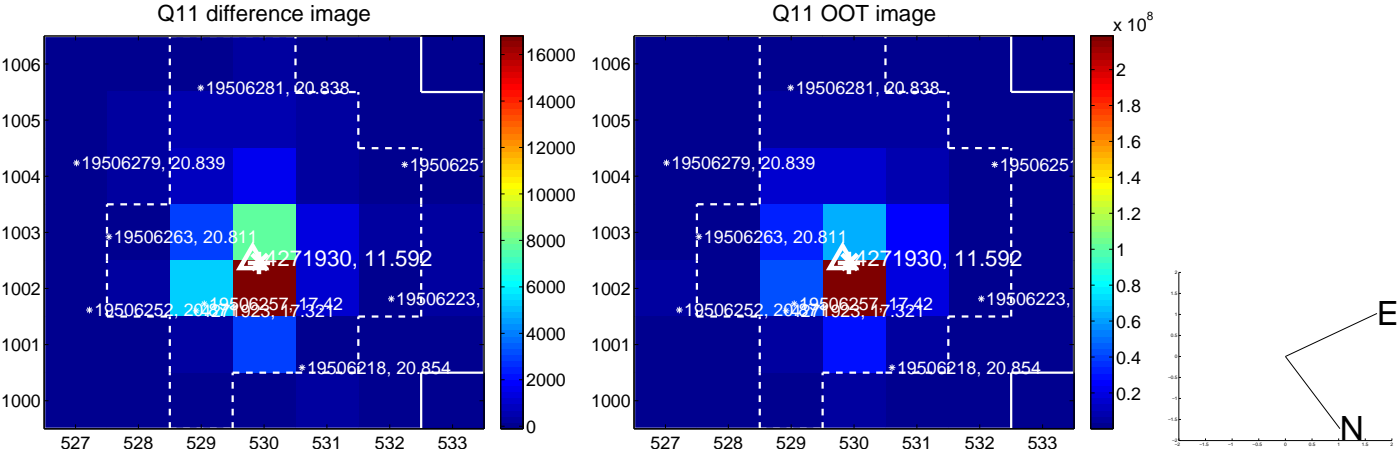
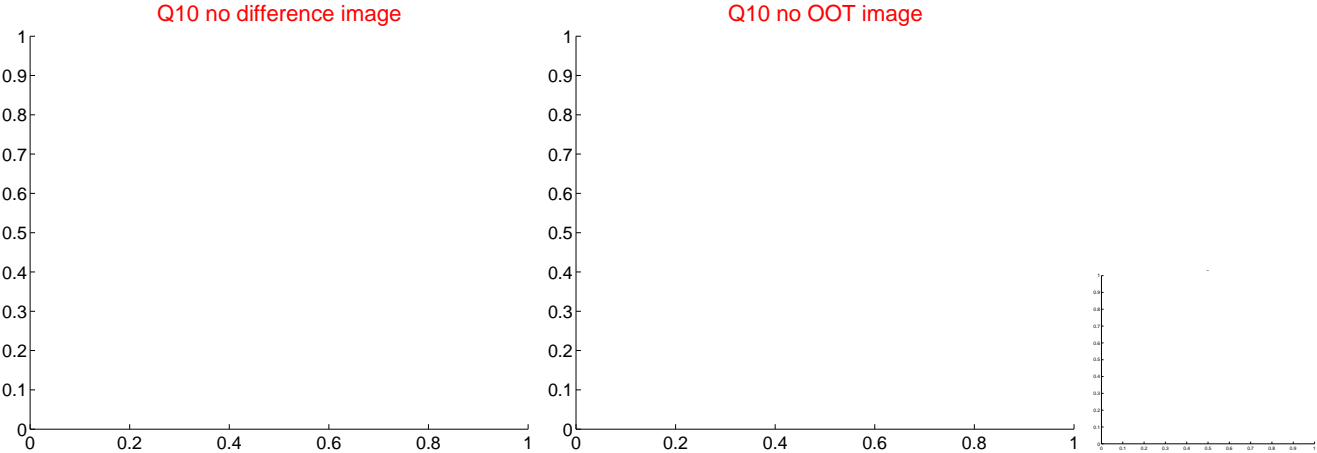
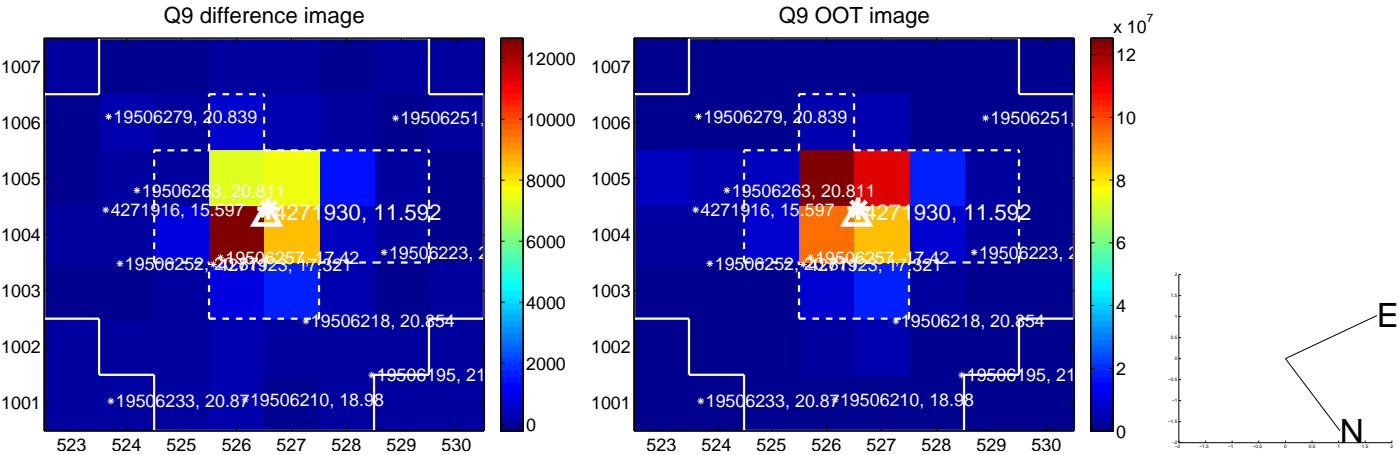
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



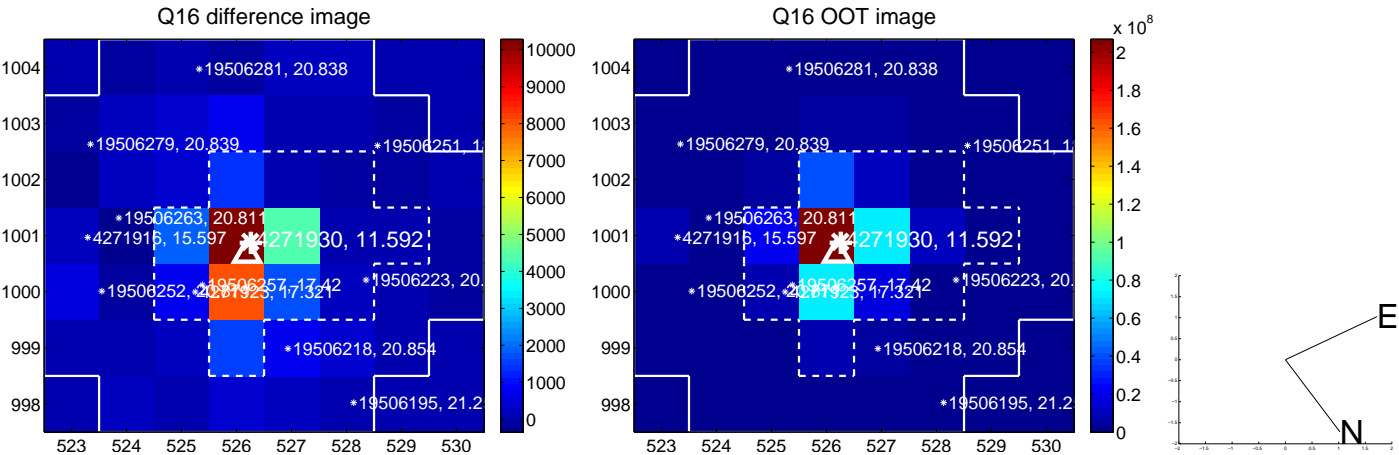
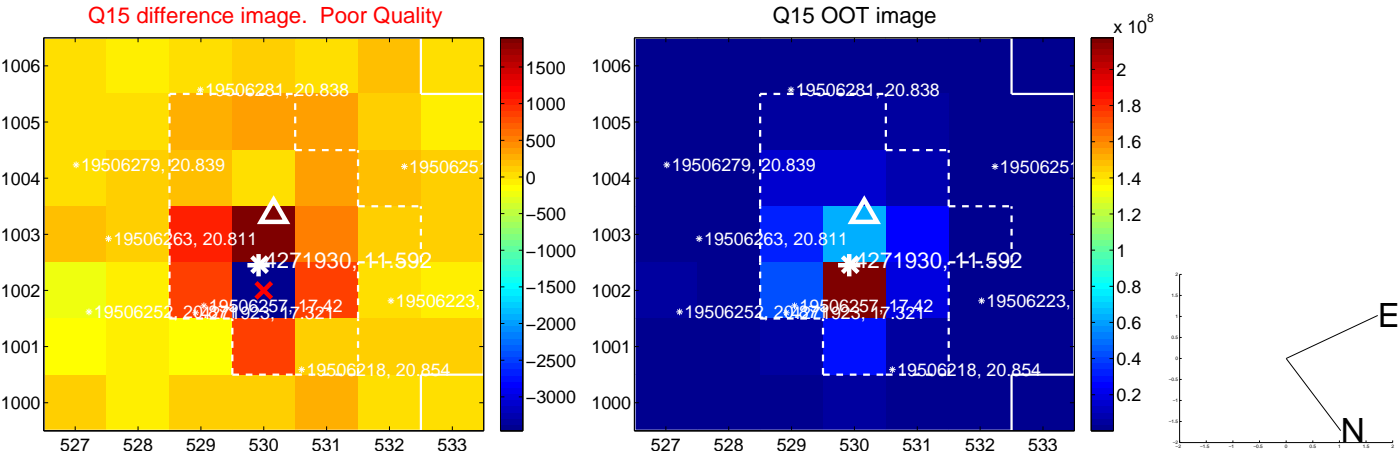
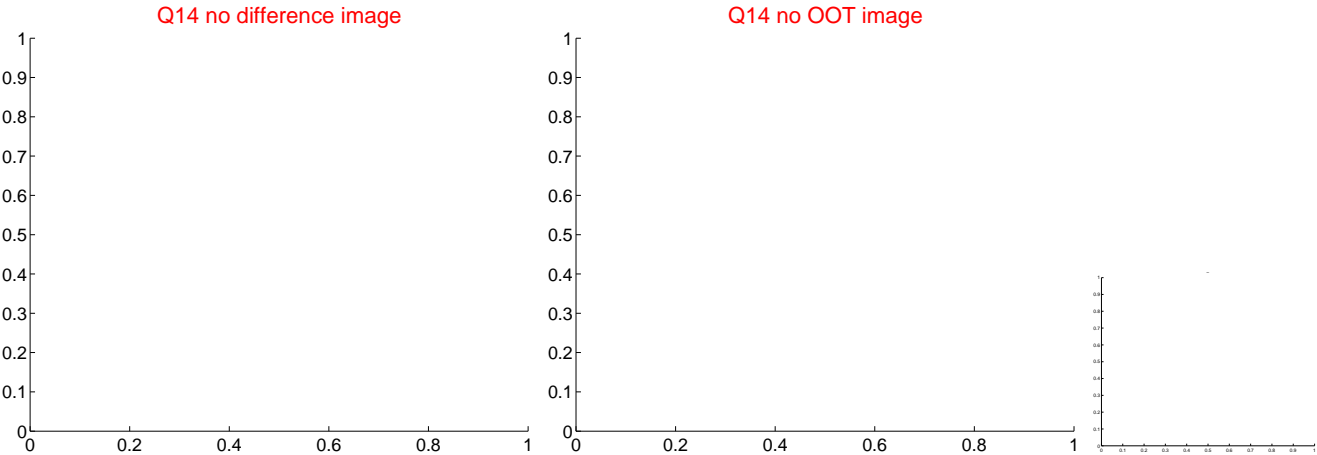
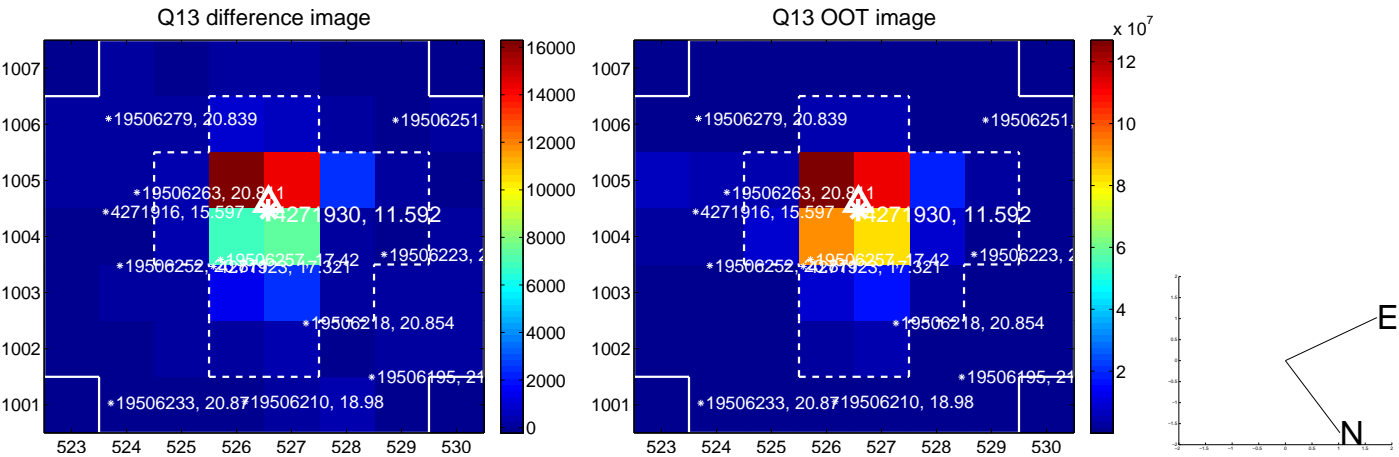
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



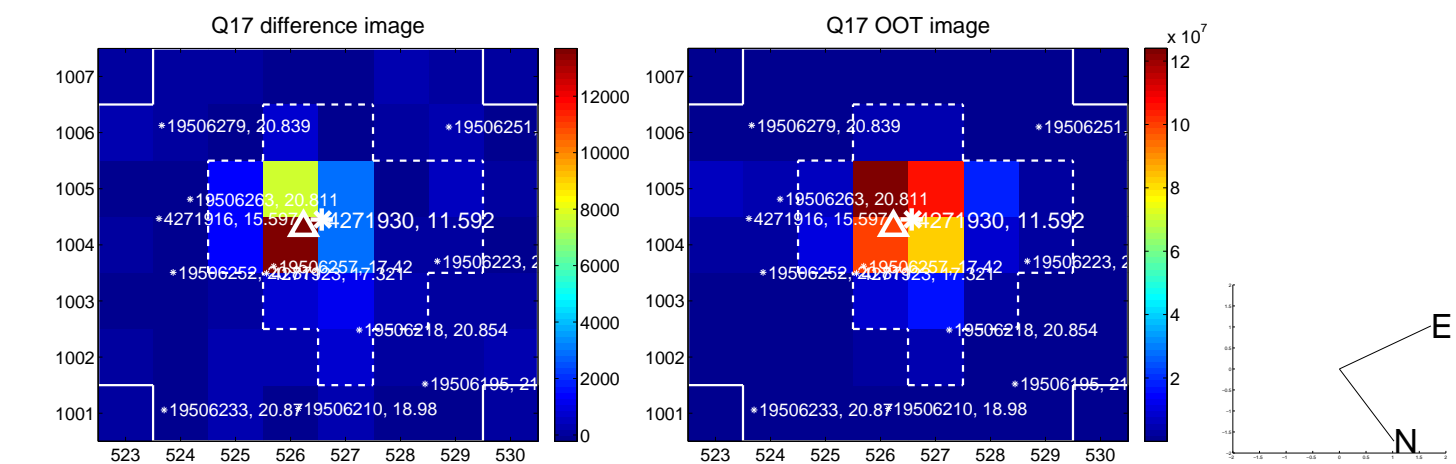
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



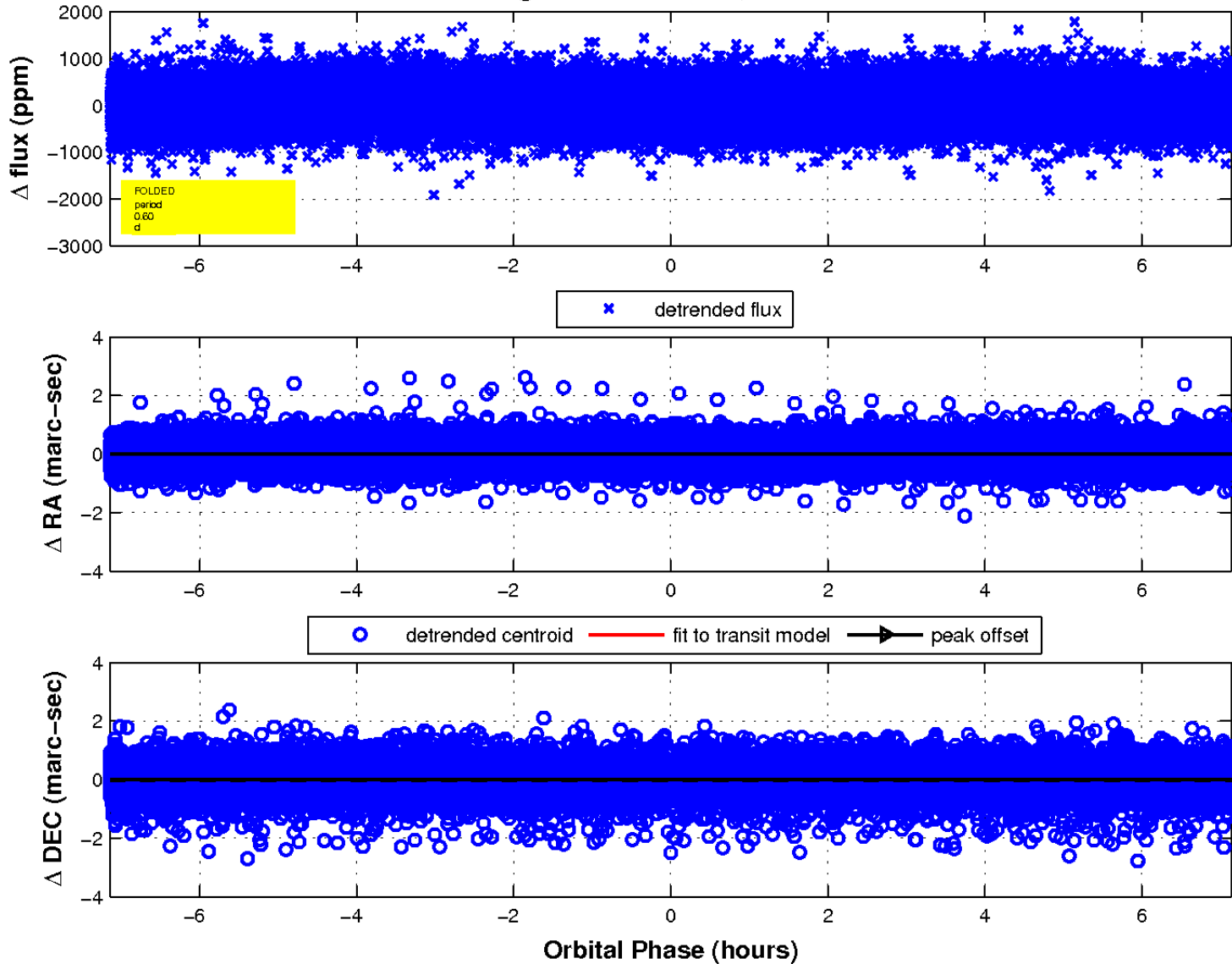
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

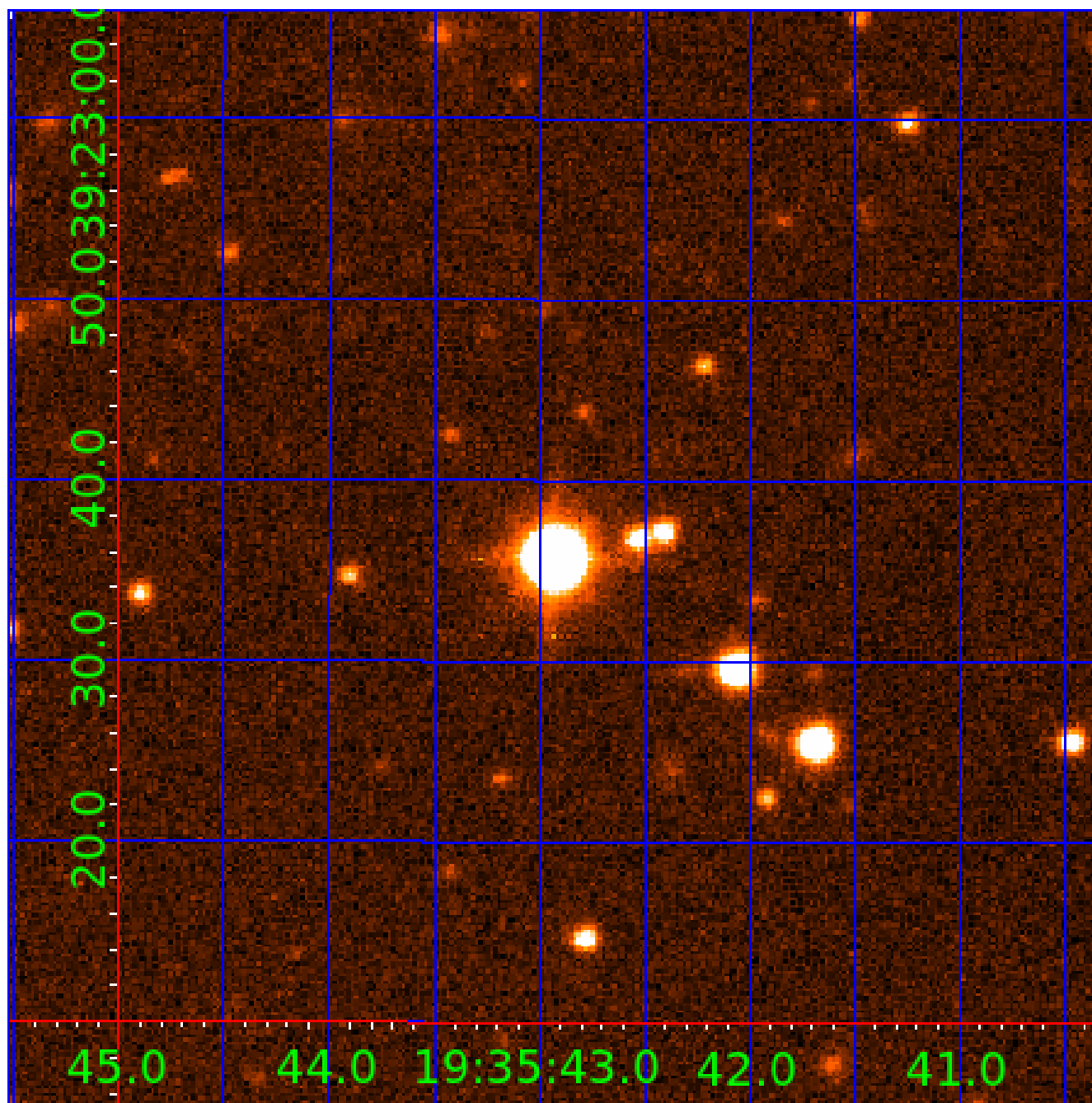


fluxWeightedCentroids, Planet 3 of 4



UKIRT Image

Declination



KIC 004271930

Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
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Robovetter Results

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004271930-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT
004271930-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT
004271930-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

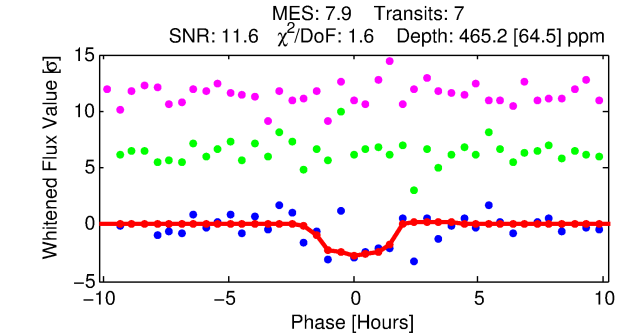
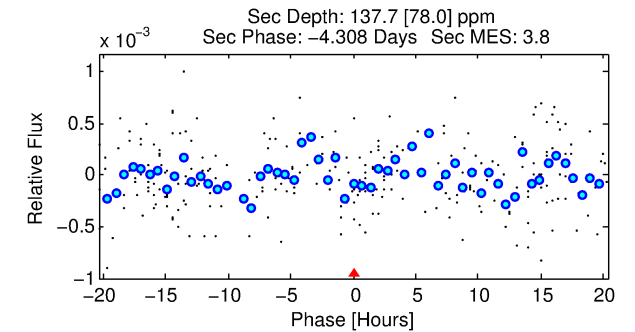
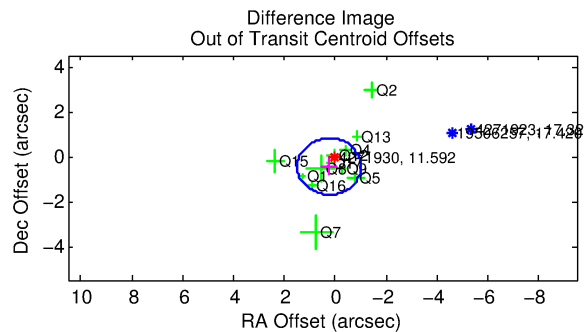
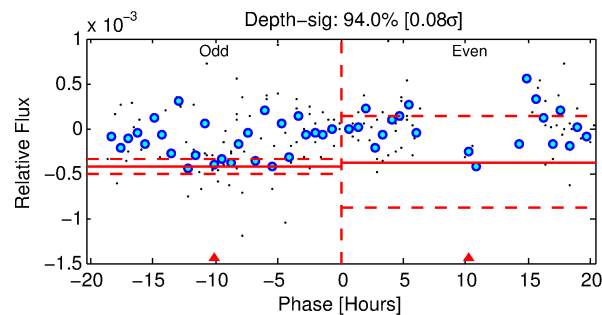
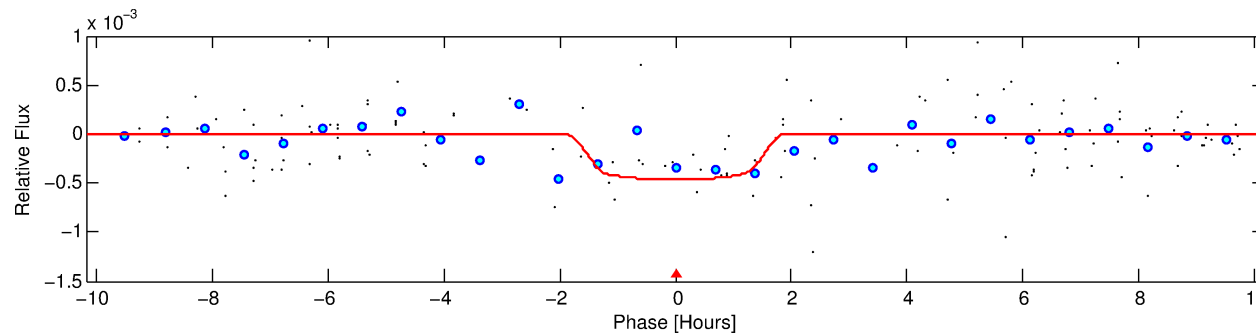
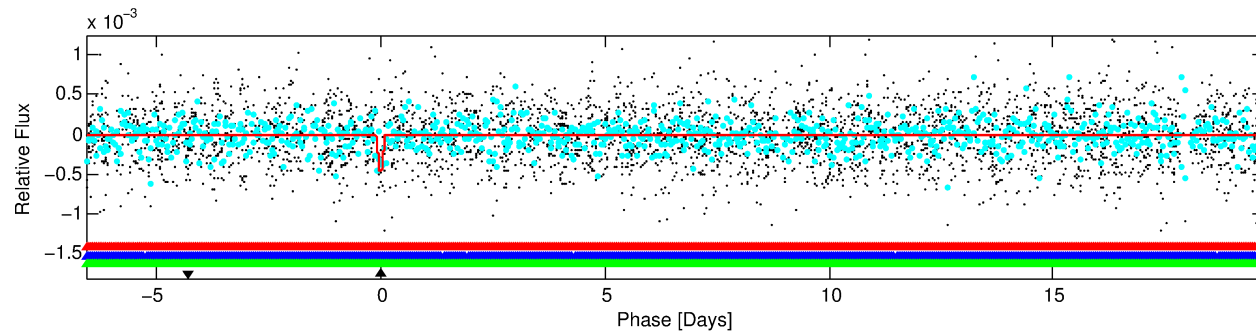
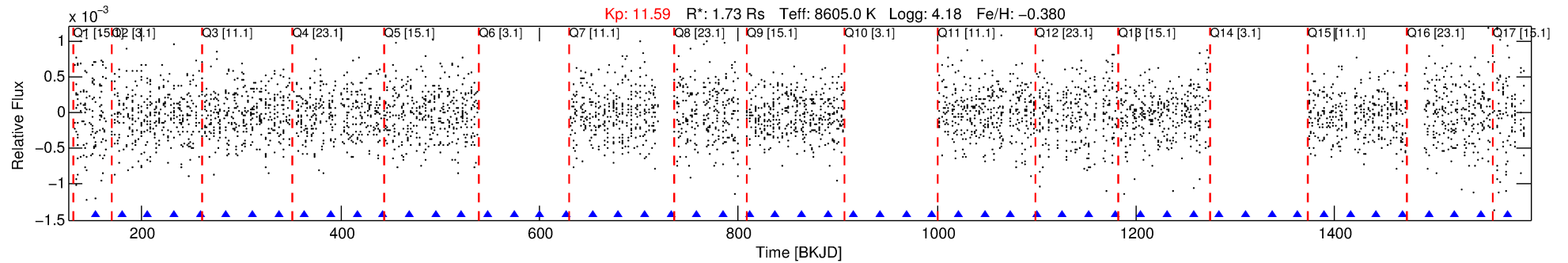
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004271930-04

No Significant Match Found

DV One-Page Summary

KIC: 4271930 Candidate: 4 of 4 Period: 26.289 d



DV Fit Results:

Period = 26.28936 [0.00044] d
Epoch = 153.7898 [0.0166] BKJD
Rp/R* = 0.0225 [0.0105]
a/R* = 32.12 [99.78]
b = 0.87 [0.88]
Seff = 350.26 [60.03]
Teff = 1103 [47] K
Rp = 4.24 [2.08] Re
a = 0.2050 [0.0238] AU
Ag = 176.96 [196.31] [0.90 σ]
Teffp = 6221 [1707] K [3.00 σ]

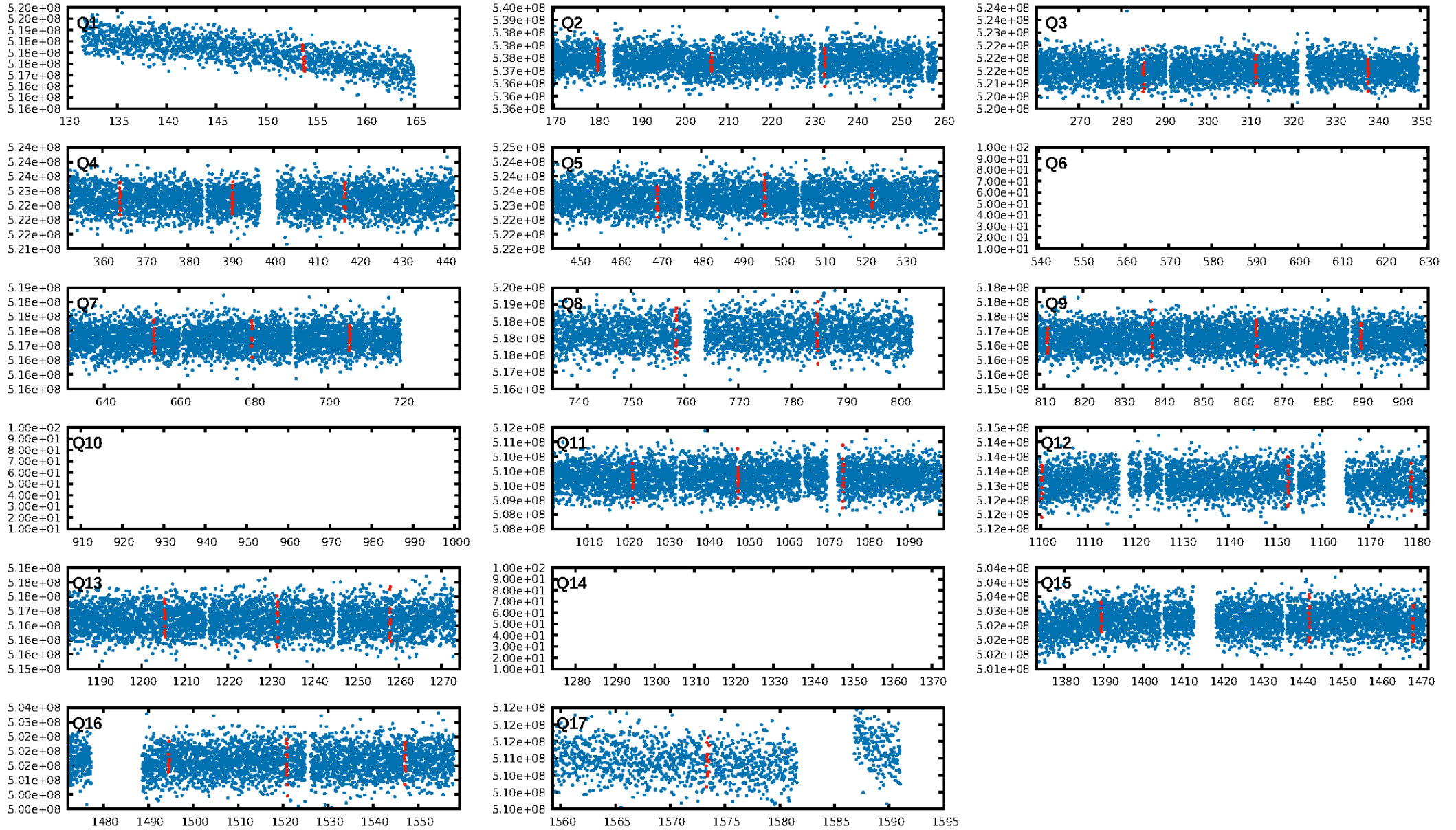
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [84.10 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 33.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 2.82e-07
RollingBand-fgt: 1.00 [6/6]
GhostDiagnostic-chr: -0.6296
Centroid-sig: 0.7%
Centroid-so: 0.237 arcsec [1.88 σ]
OotOffset-rm: 0.507 arcsec [1.21 σ]
KicOffset-rm: 0.454 arcsec [0.92 σ]
OotOffset-st: 1/2/4/5 [12]
KicOffset-st: 1/2/4/5 [12]
DiffImageQuality-fgm: 0.42 [5/12]
DiffImageOverlap-fno: 0.00 [0/14]

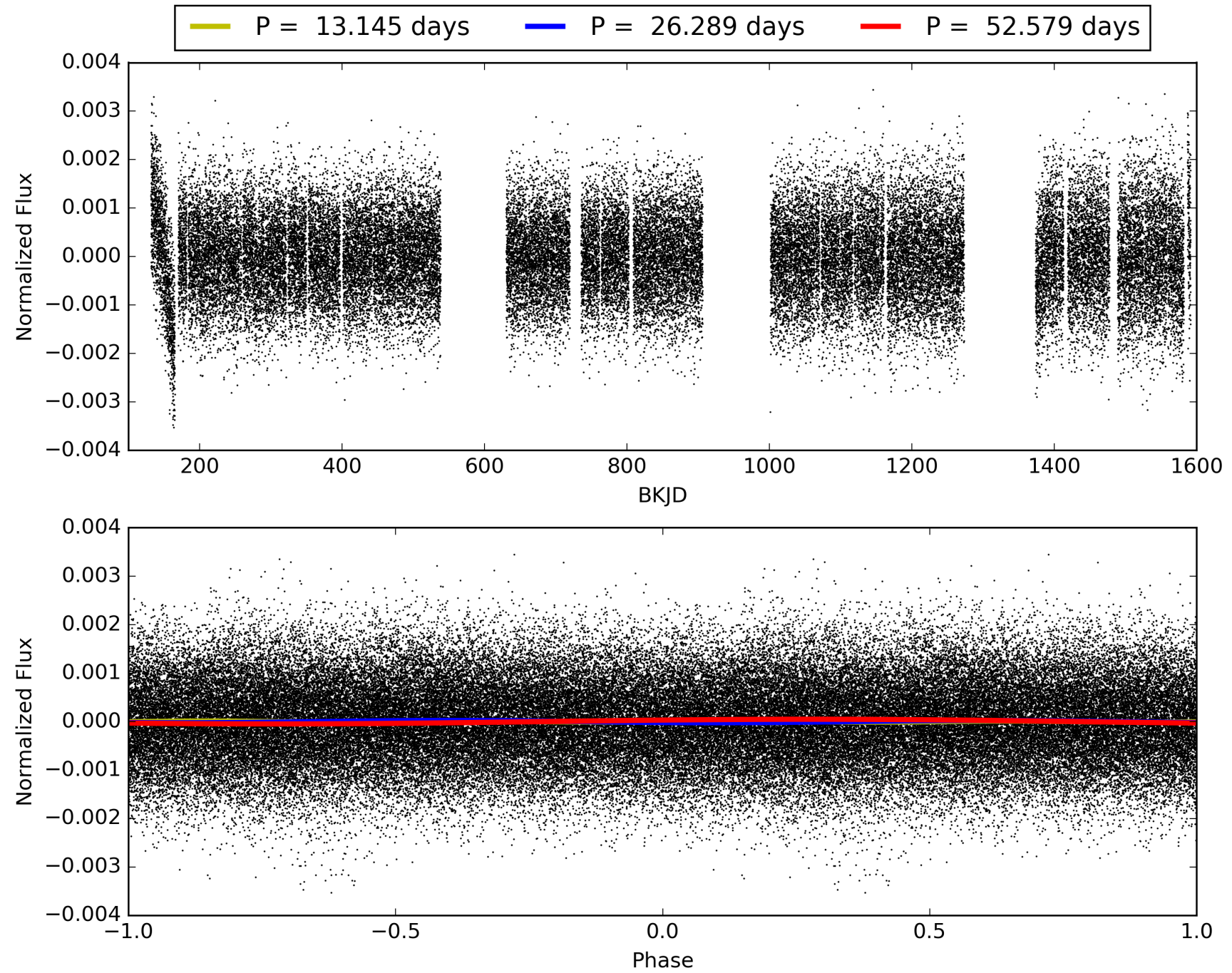
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 04:57:23 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 004271930-04, PDC Light Curves

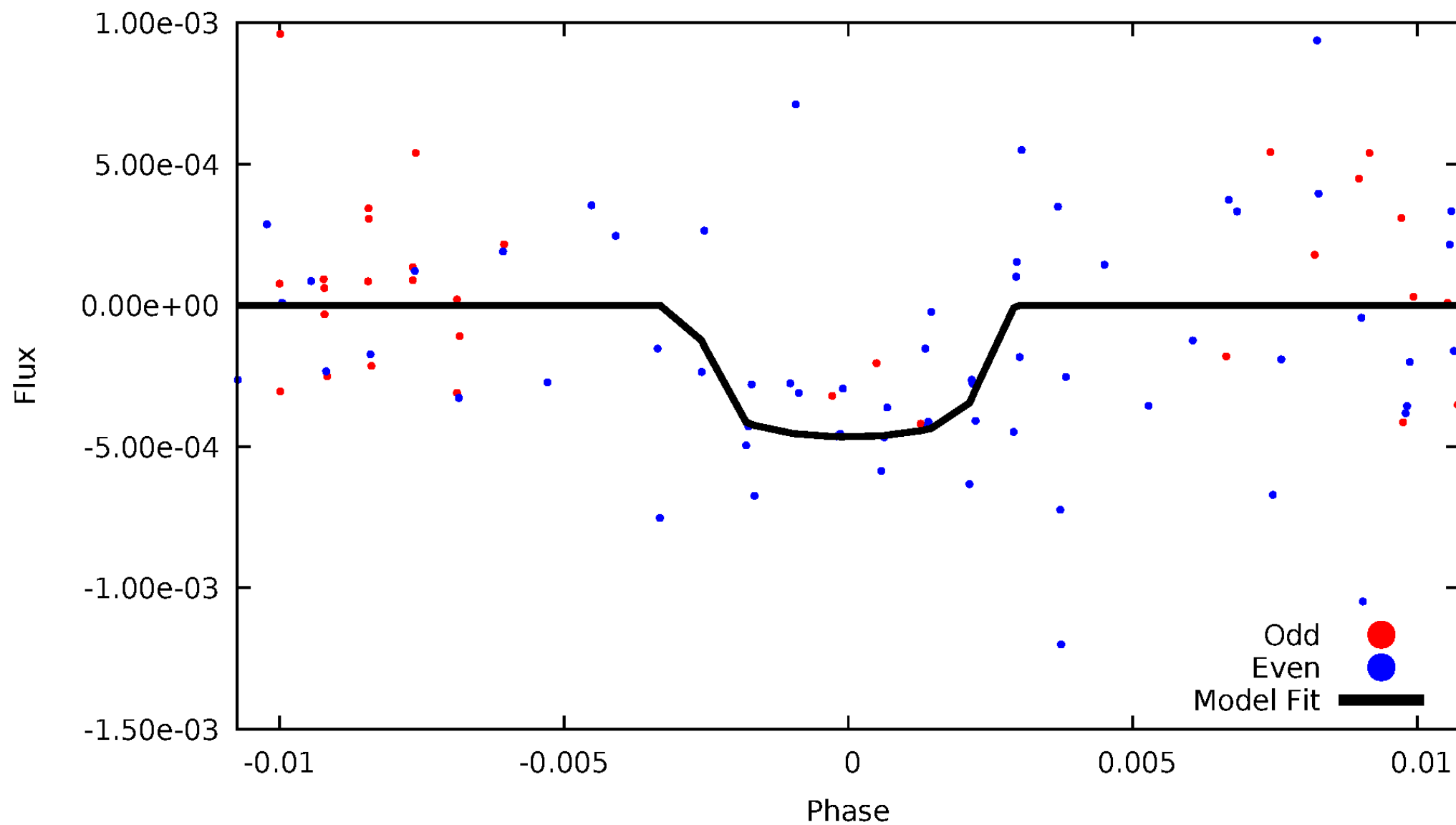


TCE 004271930-04



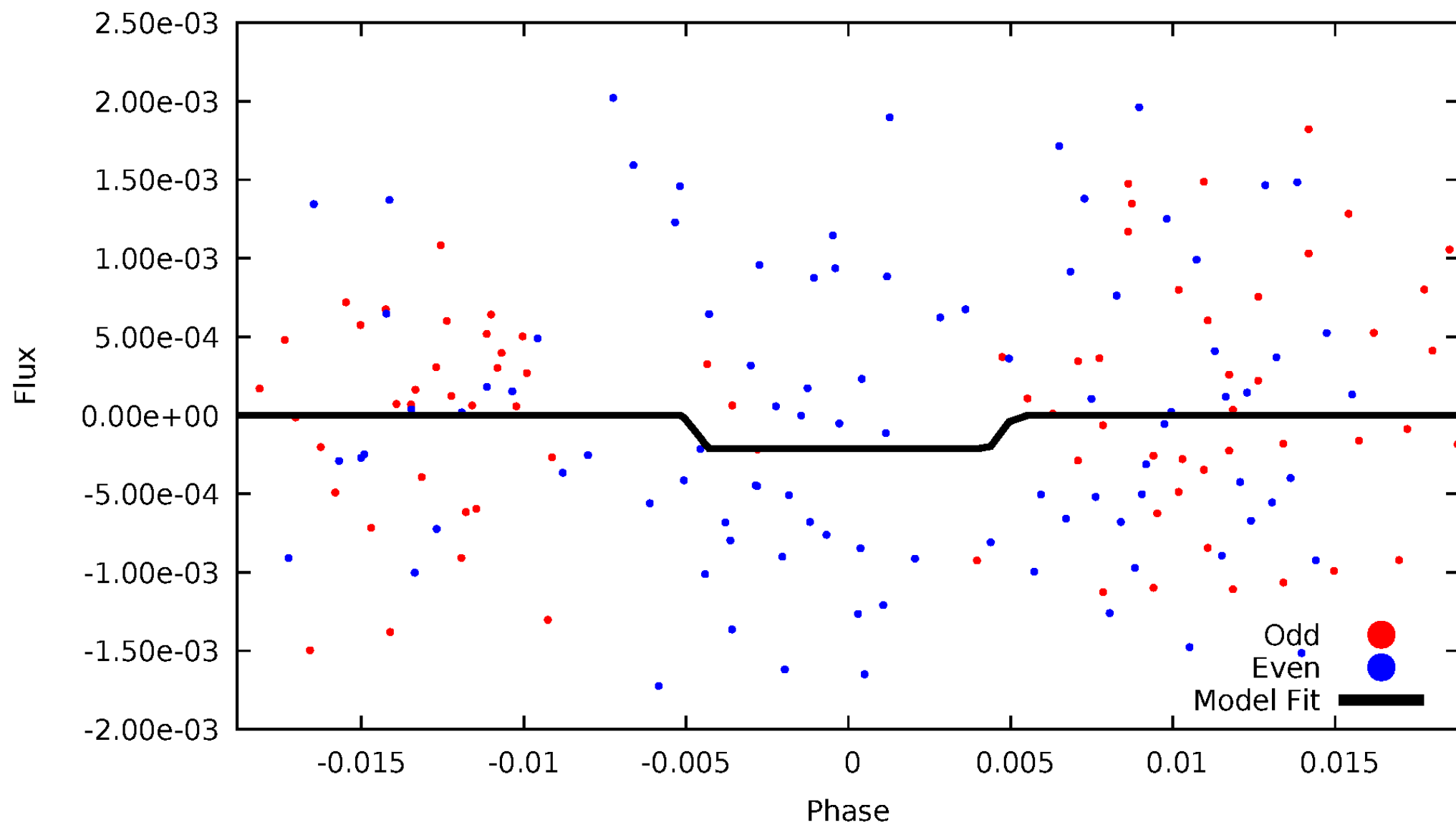
DV Odd/Even

TCE 004271930-04



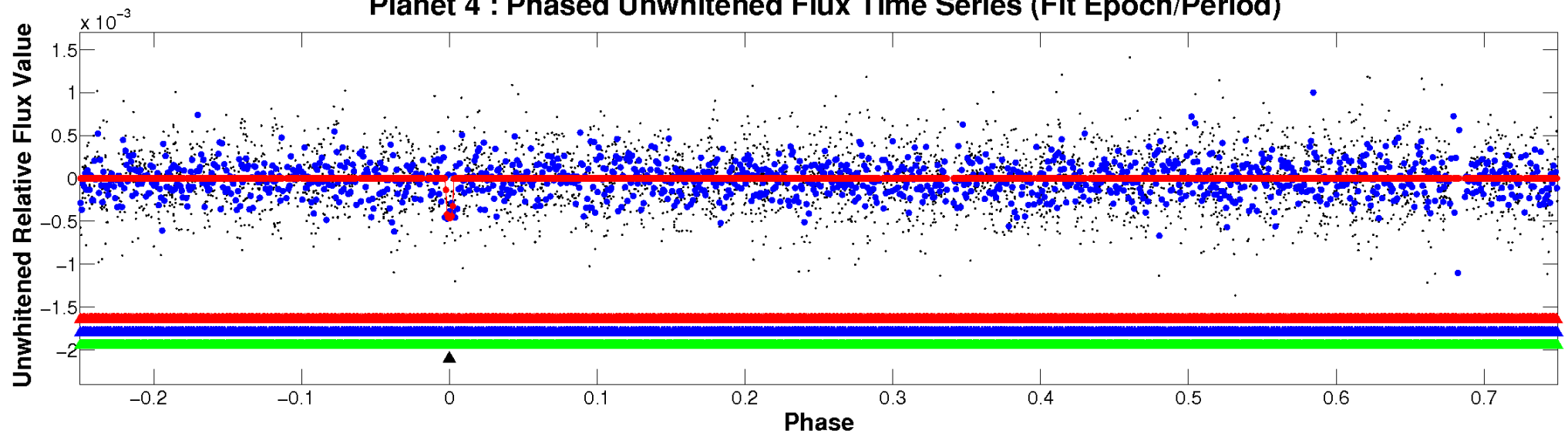
ALT Odd/Even

TCE 004271930-04

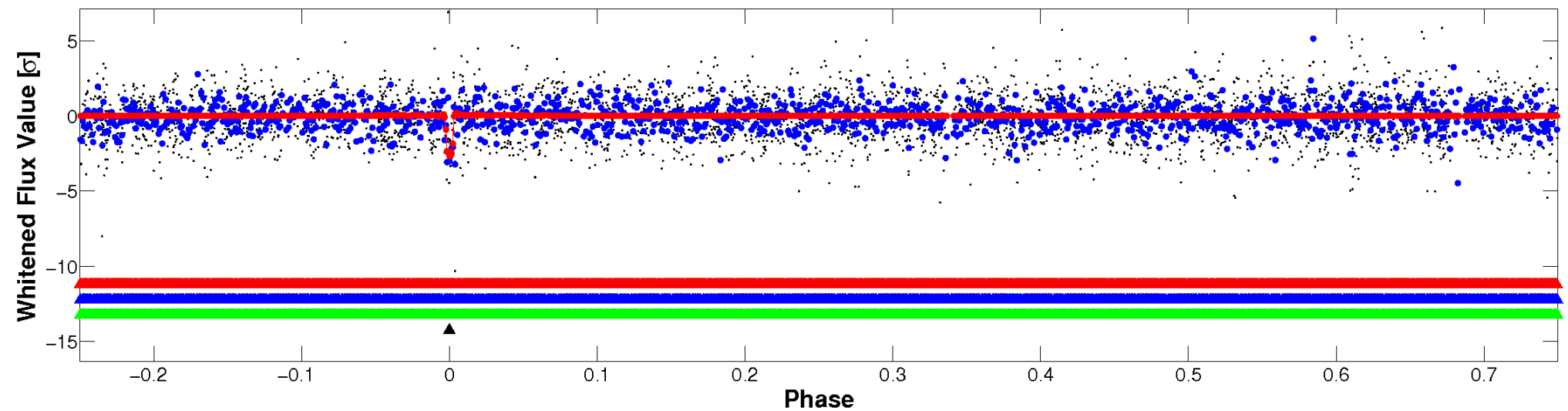


Non-Whitened Vs. Whitened Light Curve

Planet 4 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

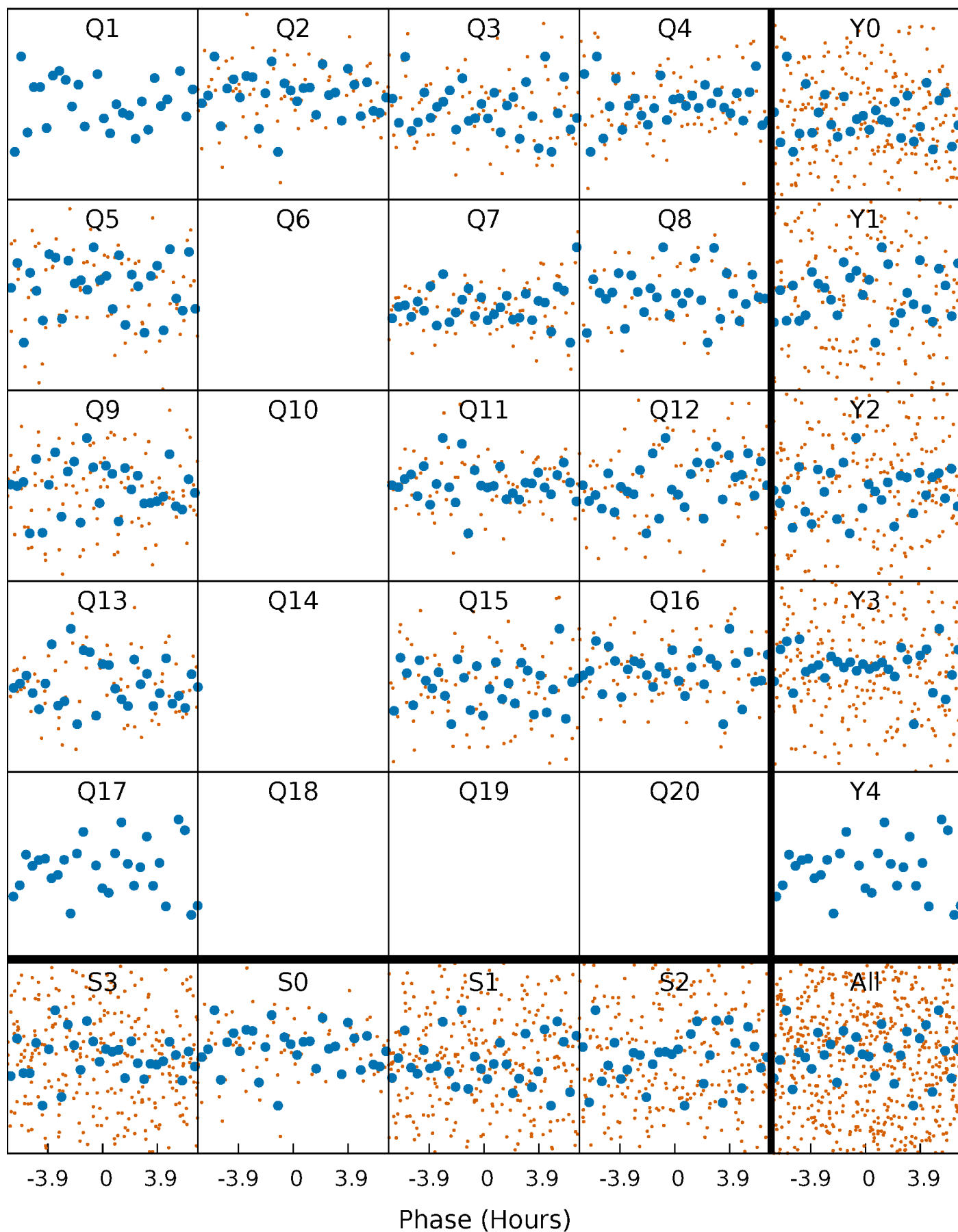


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



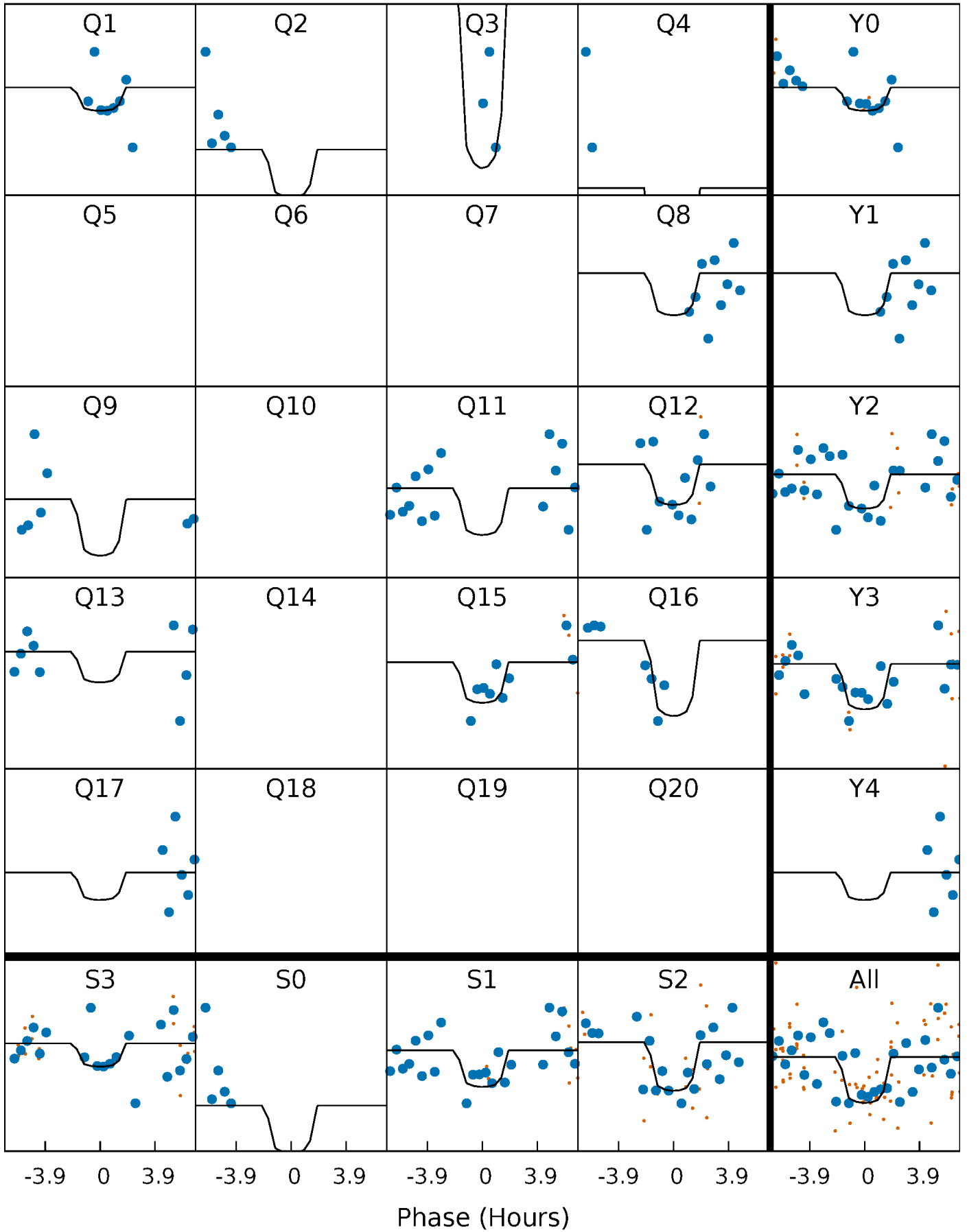
PDC Quarter-Phased Transit Curves

TCE 004271930-04 P= 26.289359 Days $T_0=153.789839$ (BKJD)



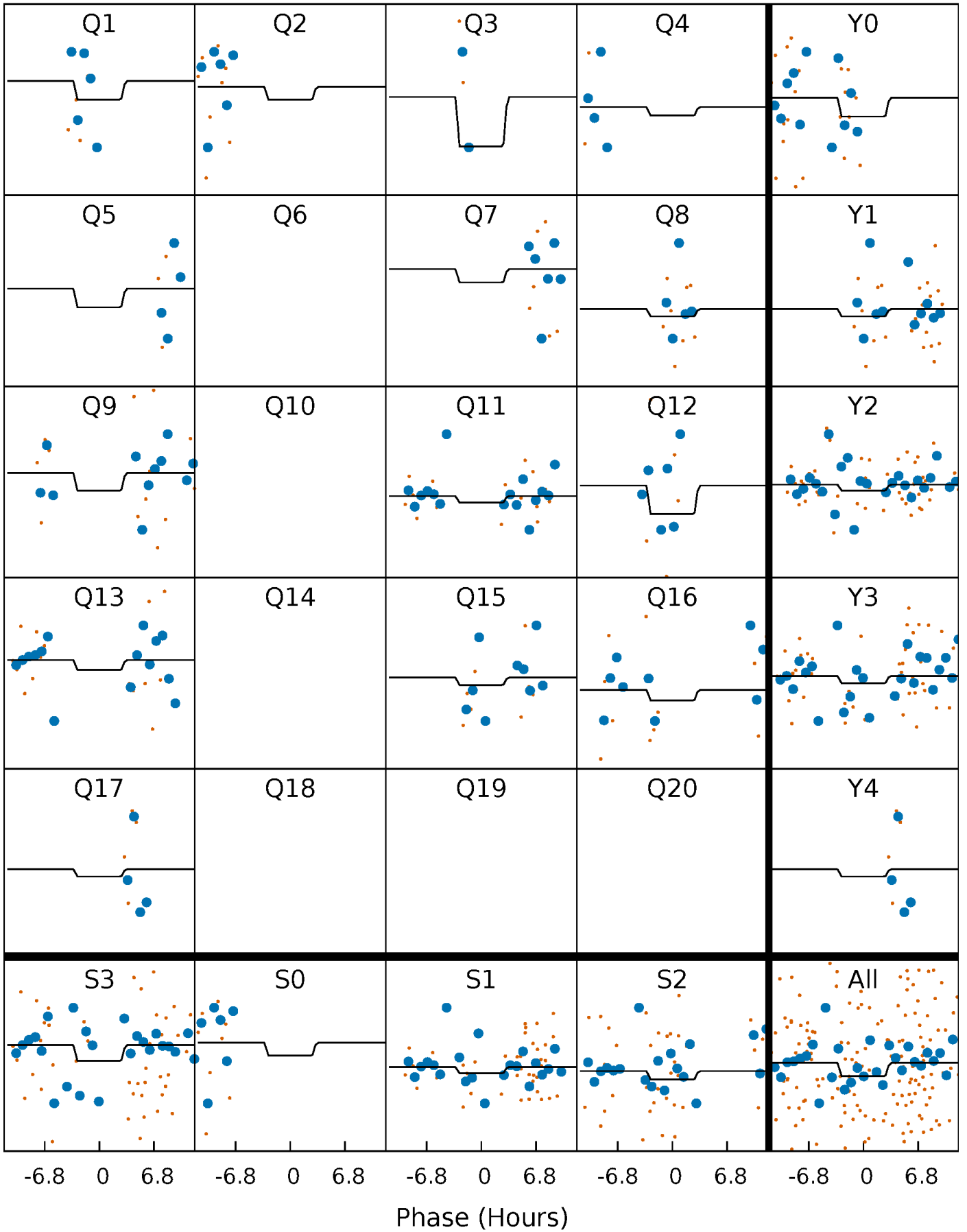
DV Quarter-Phased Transit Curves

TCE 004271930-04 P= 26.289359 Days $T_0=153.789839$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

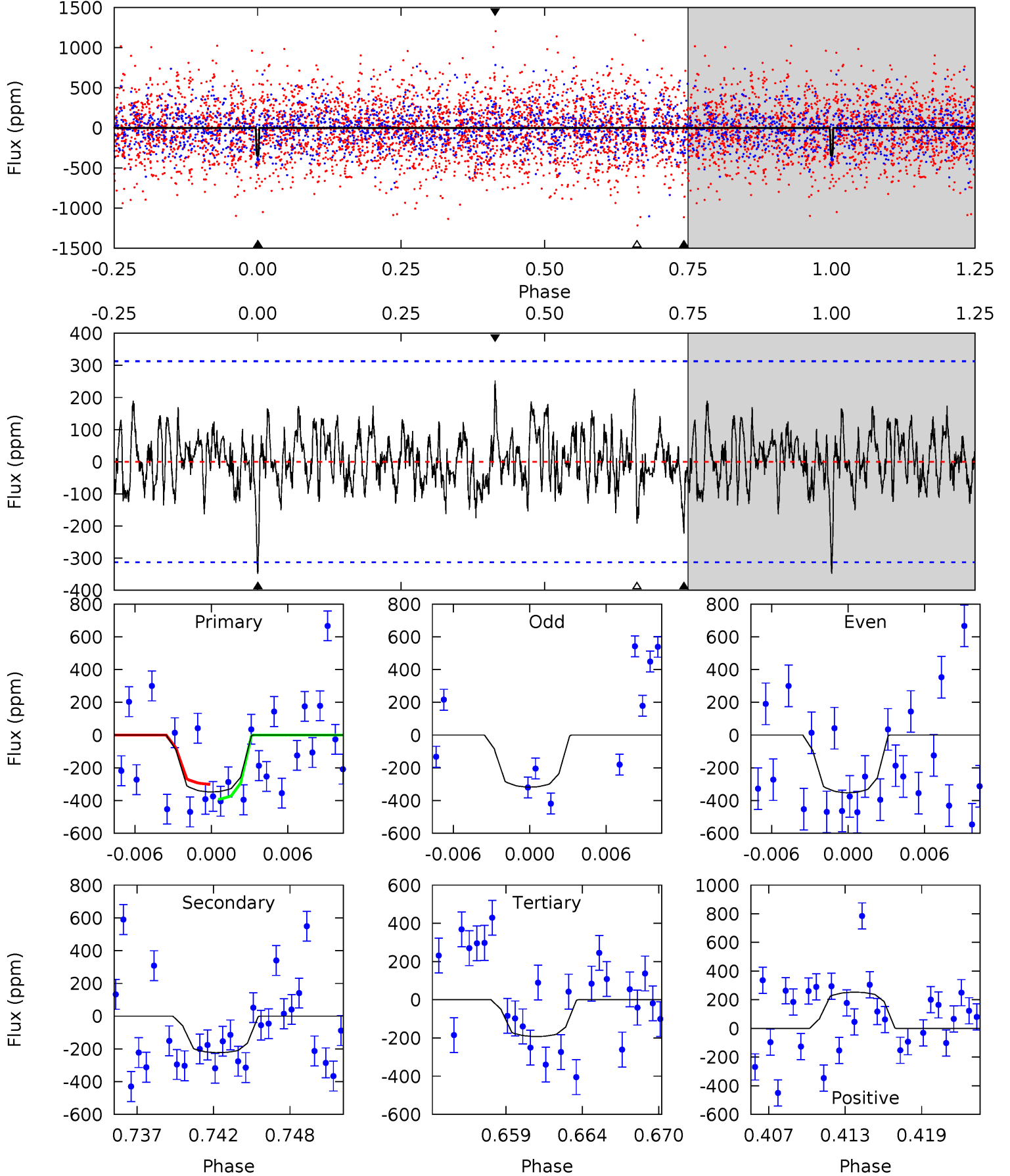
TCE 004271930-04 P= 26.288056 Days $T_0=153.905905$ (BKJD)



DV Model-Shift Uniqueness Test

004271930-04, P = 26.289359 Days, E = 127.500480 Days

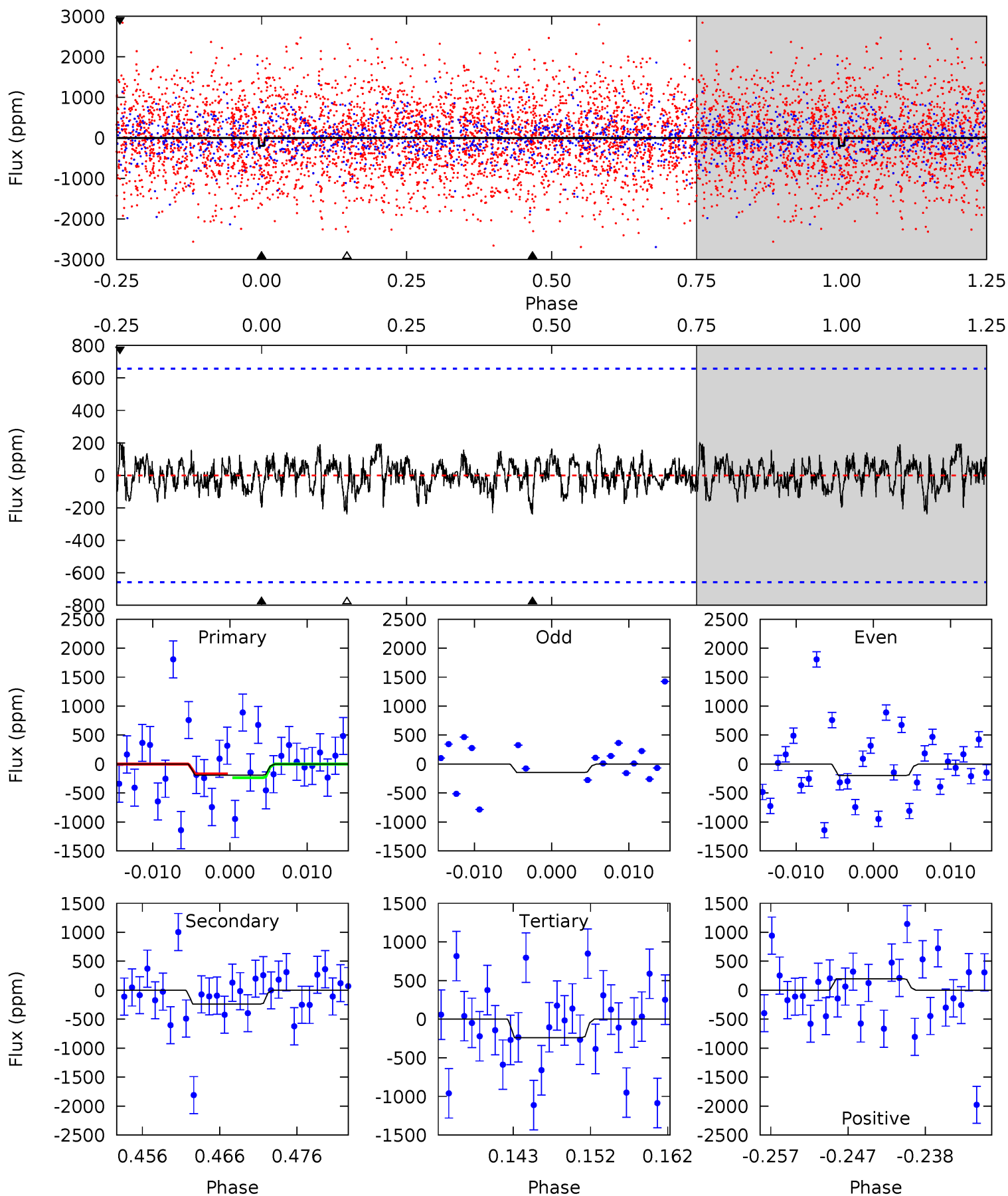
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.71	3.67	3.16	4.16	5.14	2.77	1.17	2.55	1.56	0.50	-0.49	0.18	0.93	0.42	0.75



Alt Model-Shift Uniqueness Test

004271930-04, P = 26.288056 Days, E = 127.617849 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.48	1.84	1.84	1.52	5.04	2.59	0.55	-0.36	-0.04	0.01	0.32	0.14	1.24	0.45	0.26



Stellar Parameters For KIC 004271930

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	8605^{+77}_{-86}	$4.182^{+0.090}_{-0.090}$	$-0.380^{+0.050}_{-0.150}$	$1.731^{+0.242}_{-0.242}$	$1.660^{+0.081}_{-0.128}$	$0.451^{+0.187}_{-0.132}$
	+1%/-1%	+2%/-2%	+13%/-39%	+14%/-14%	+5%/-8%	+41%/-29%
Source	SPE68	SPE68	SPE68	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 004271930-04 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-223 ± 61	$4.31^{+1.94}_{-1.90}$	1539^{+54}_{-56}	6648^{+2907}_{-1187}	278^{+607}_{-160}
Alt.	-241 ± 131	$2.96^{+1.95}_{-1.68}$	1539^{+57}_{-52}	8344^{+8100}_{-2551}	590^{+2764}_{-437}

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{obs} \gg T_{max}$ AND $A_{obs} \gg 1.0$

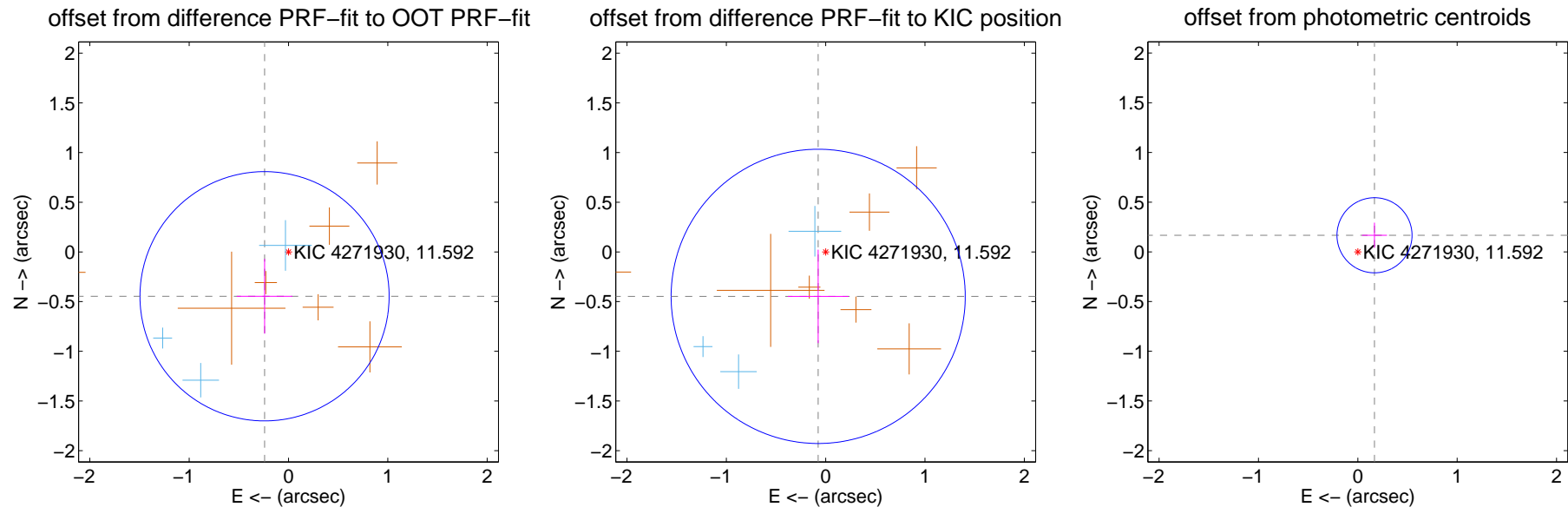
DV Centroid Data

Supplemental centroid analysis for 004271930-04. **Kepler magnitude: 11.59.** Transit SNR 11.55

There are 5 quarters with good PRF difference image offsets

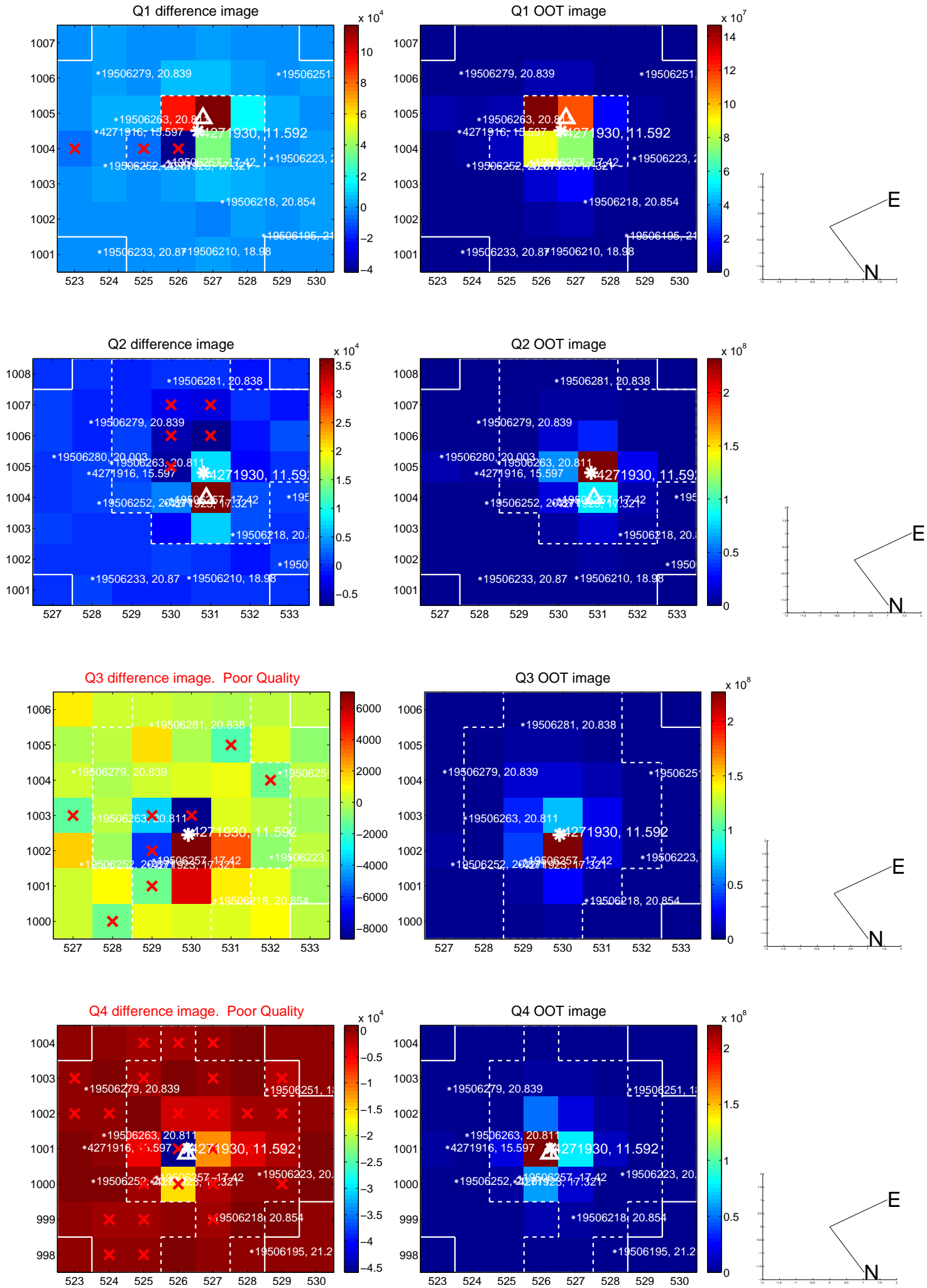
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.507 ± 0.418	1.21	0.241 ± 0.280	-0.446 ± 0.377
PRF-fit source offset from KIC position	0.454 ± 0.494	0.92	0.075 ± 0.305	-0.447 ± 0.470
photometric centroid source offset	0.24 ± 0.13	1.88	-0.17 ± 0.13	0.17 ± 0.13

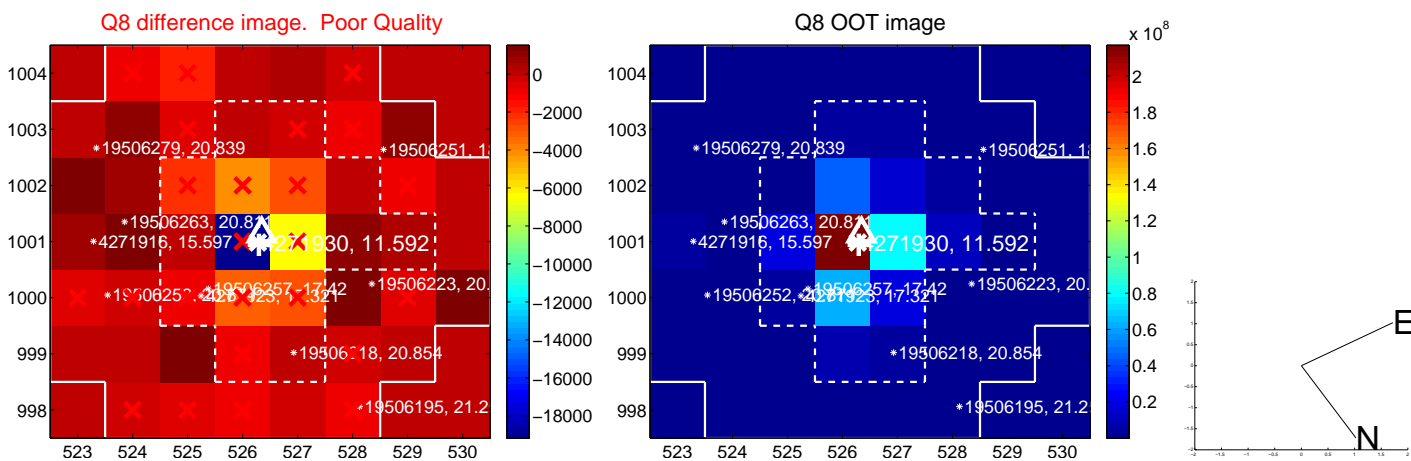
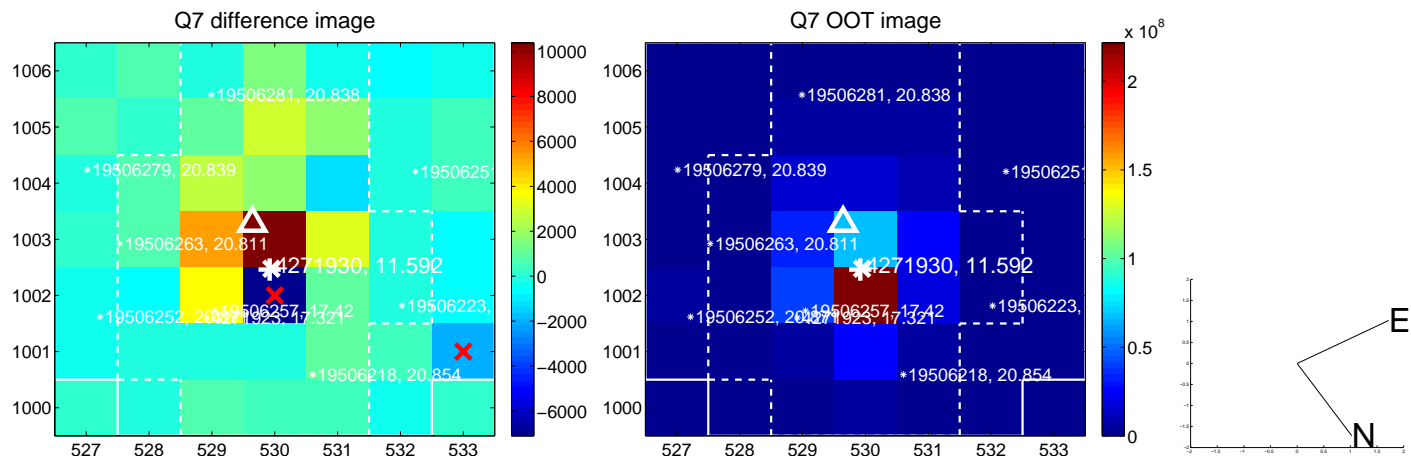
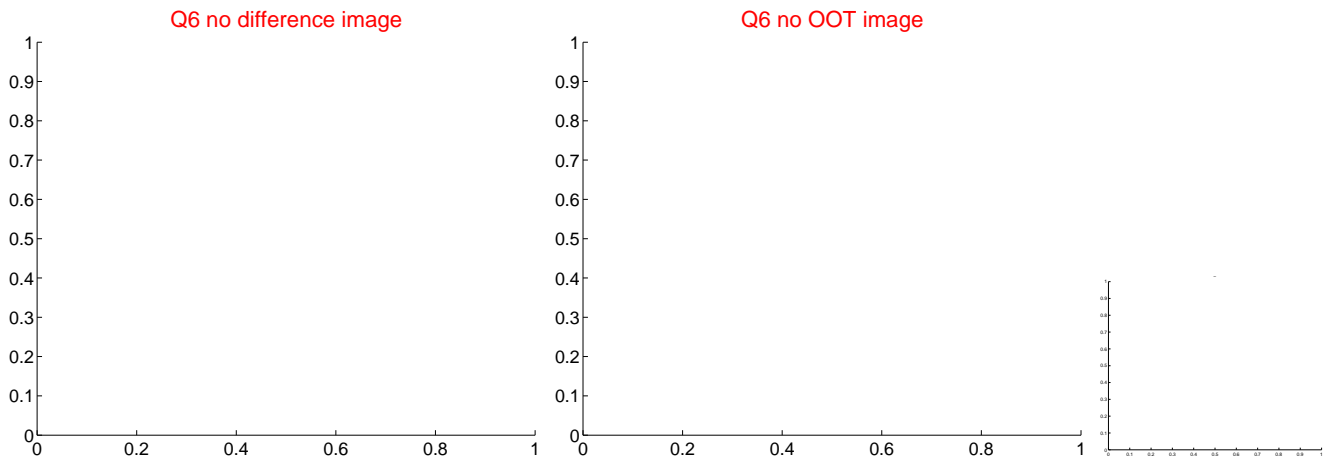
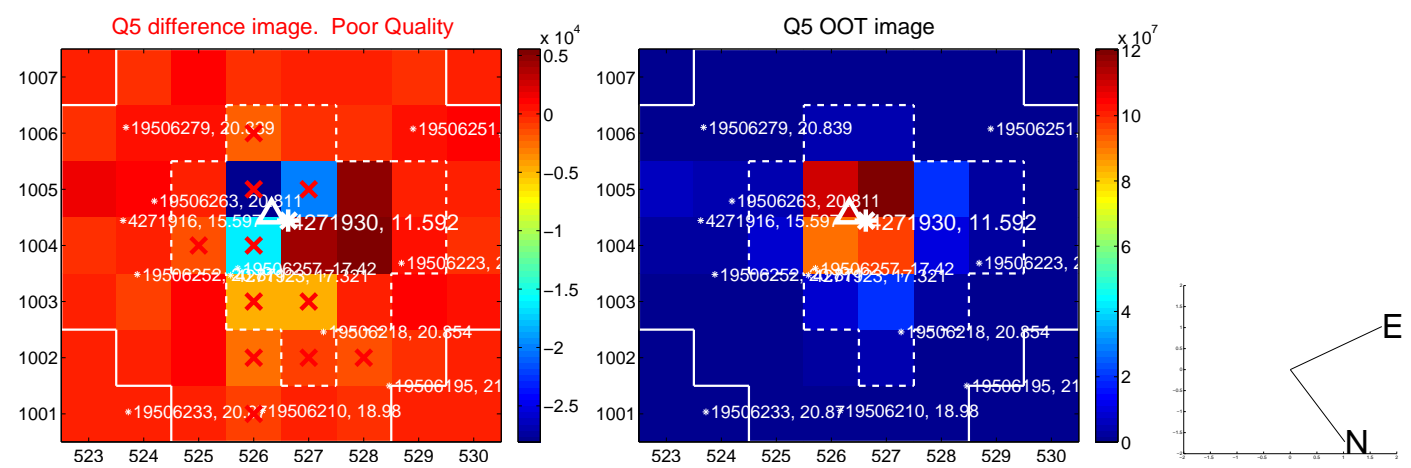


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

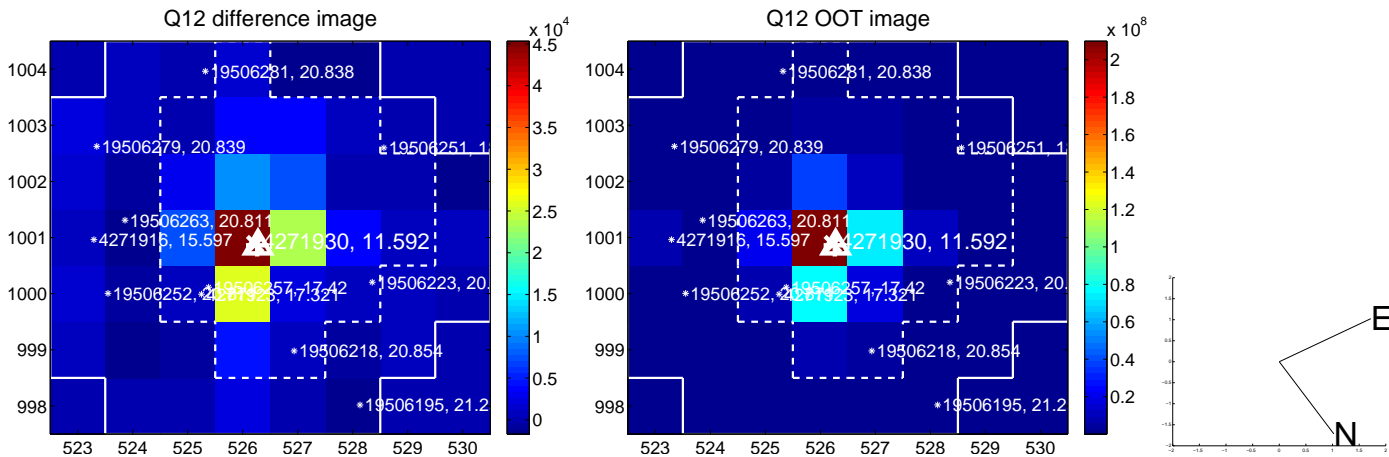
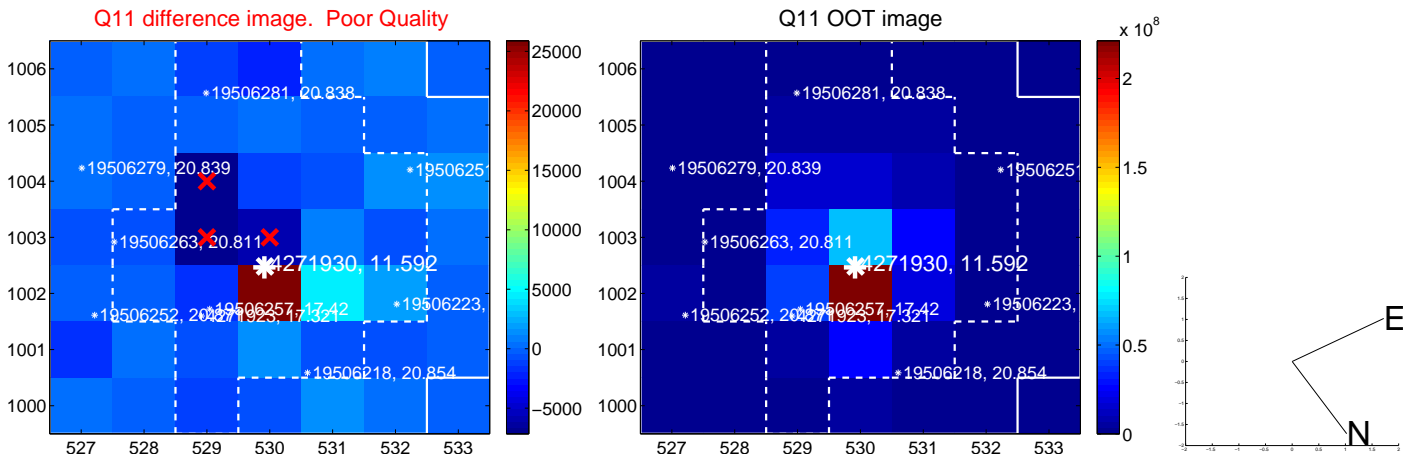
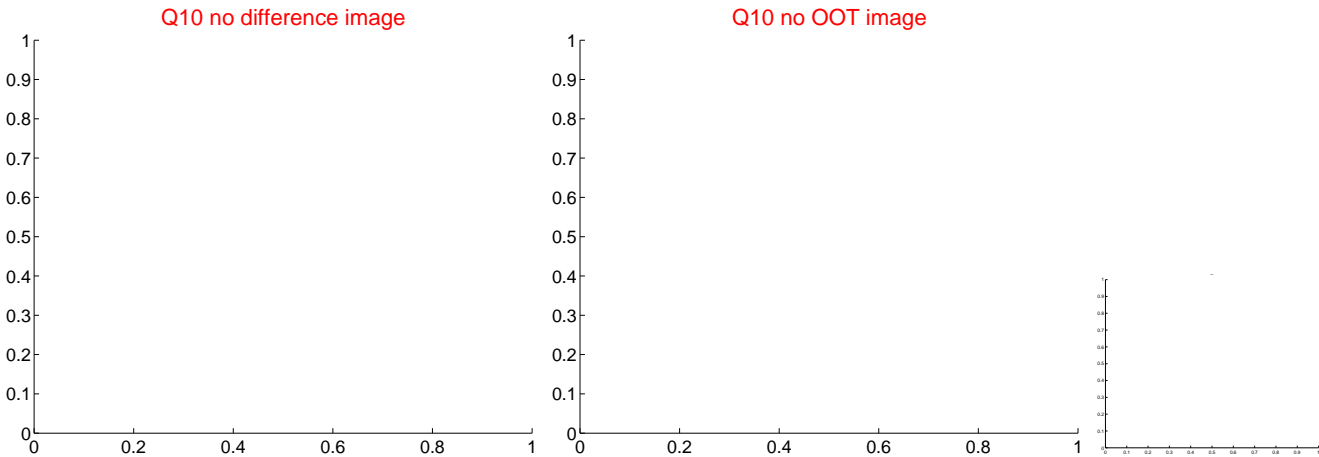
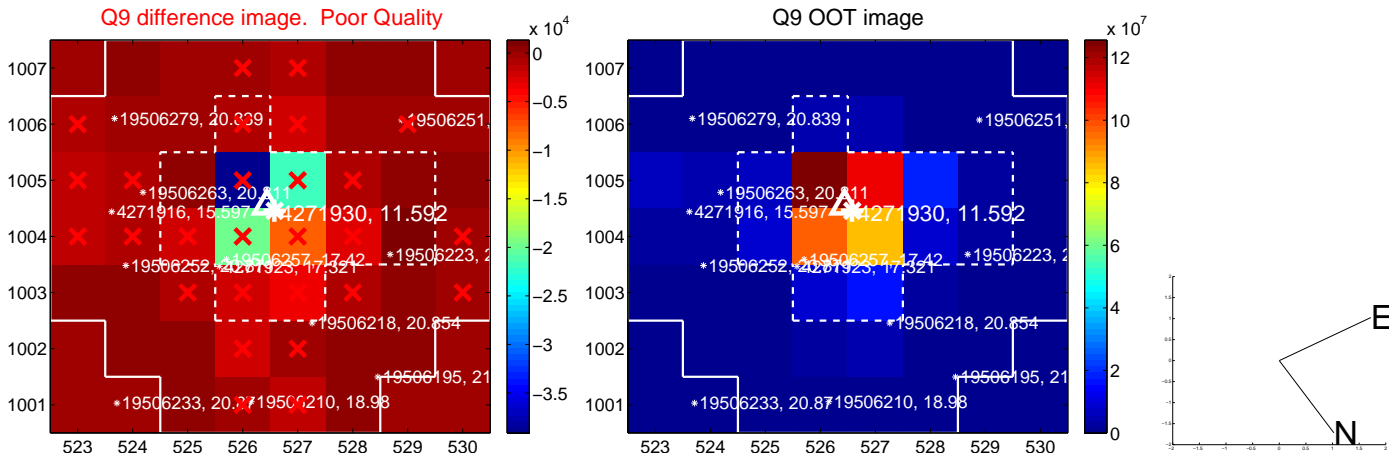
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



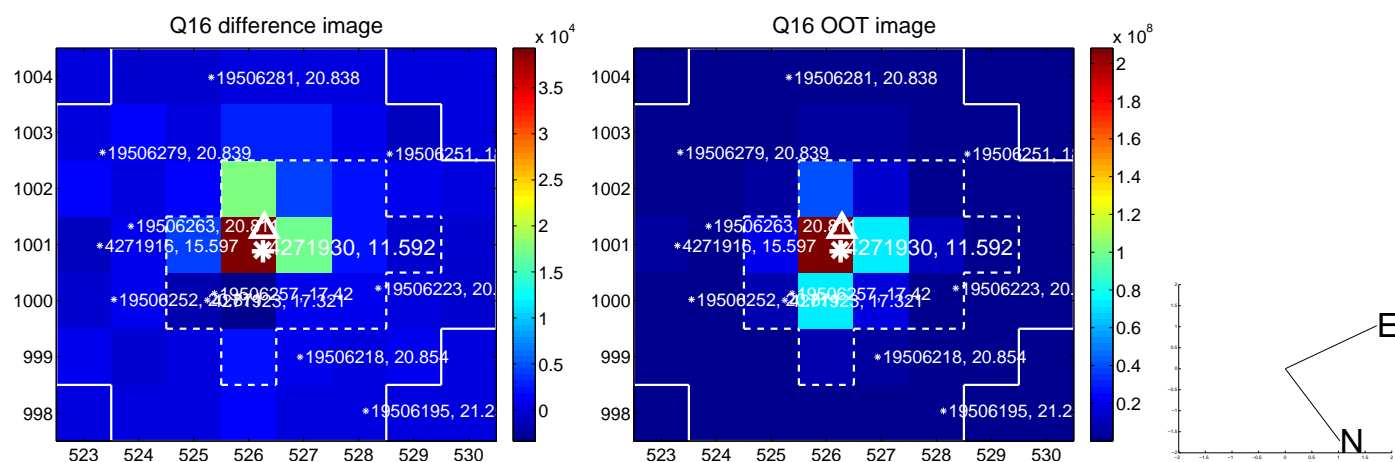
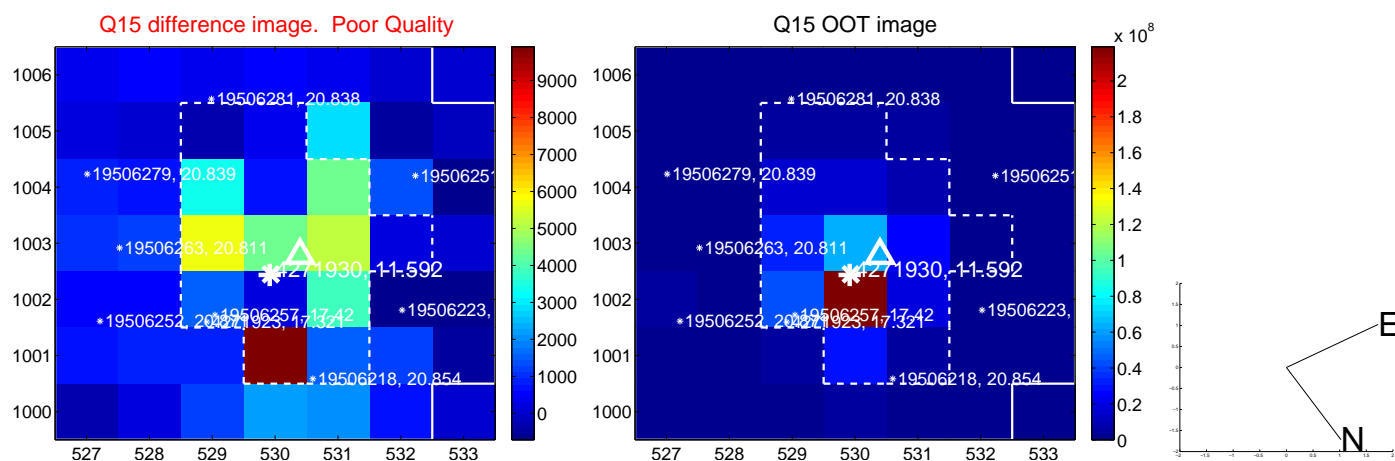
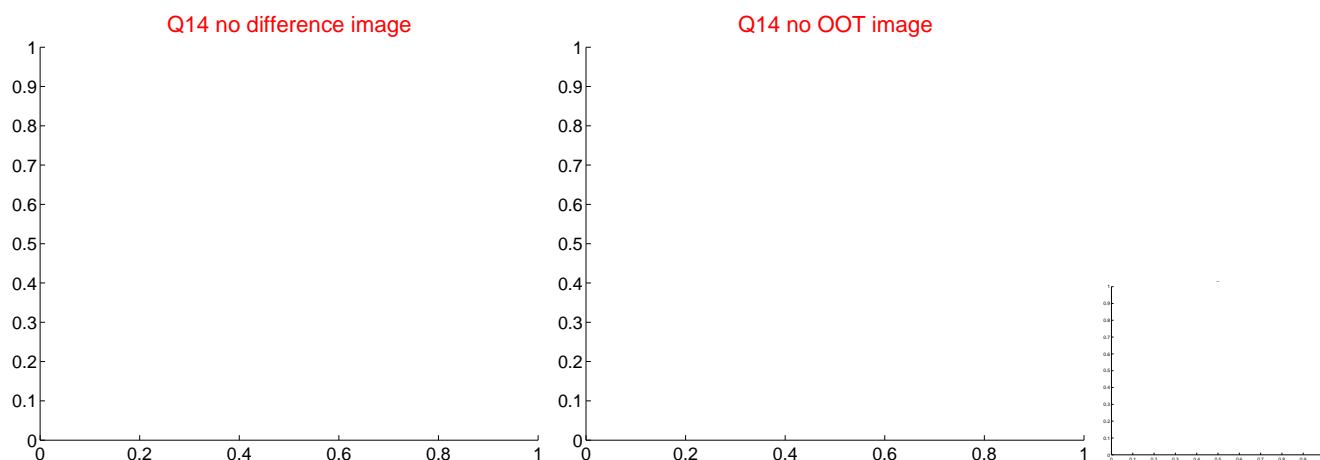
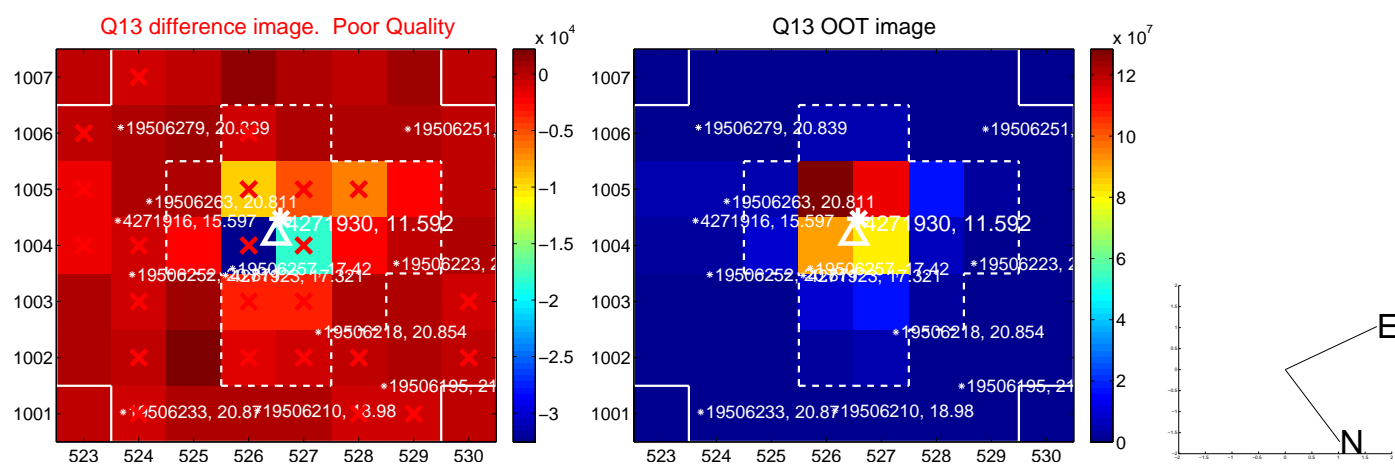
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



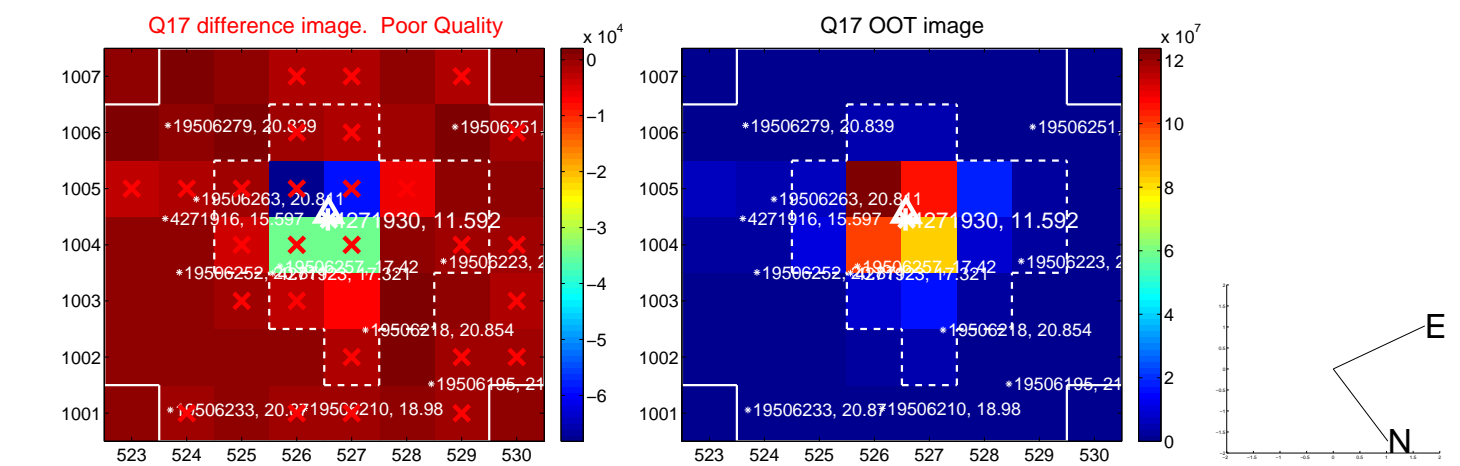
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



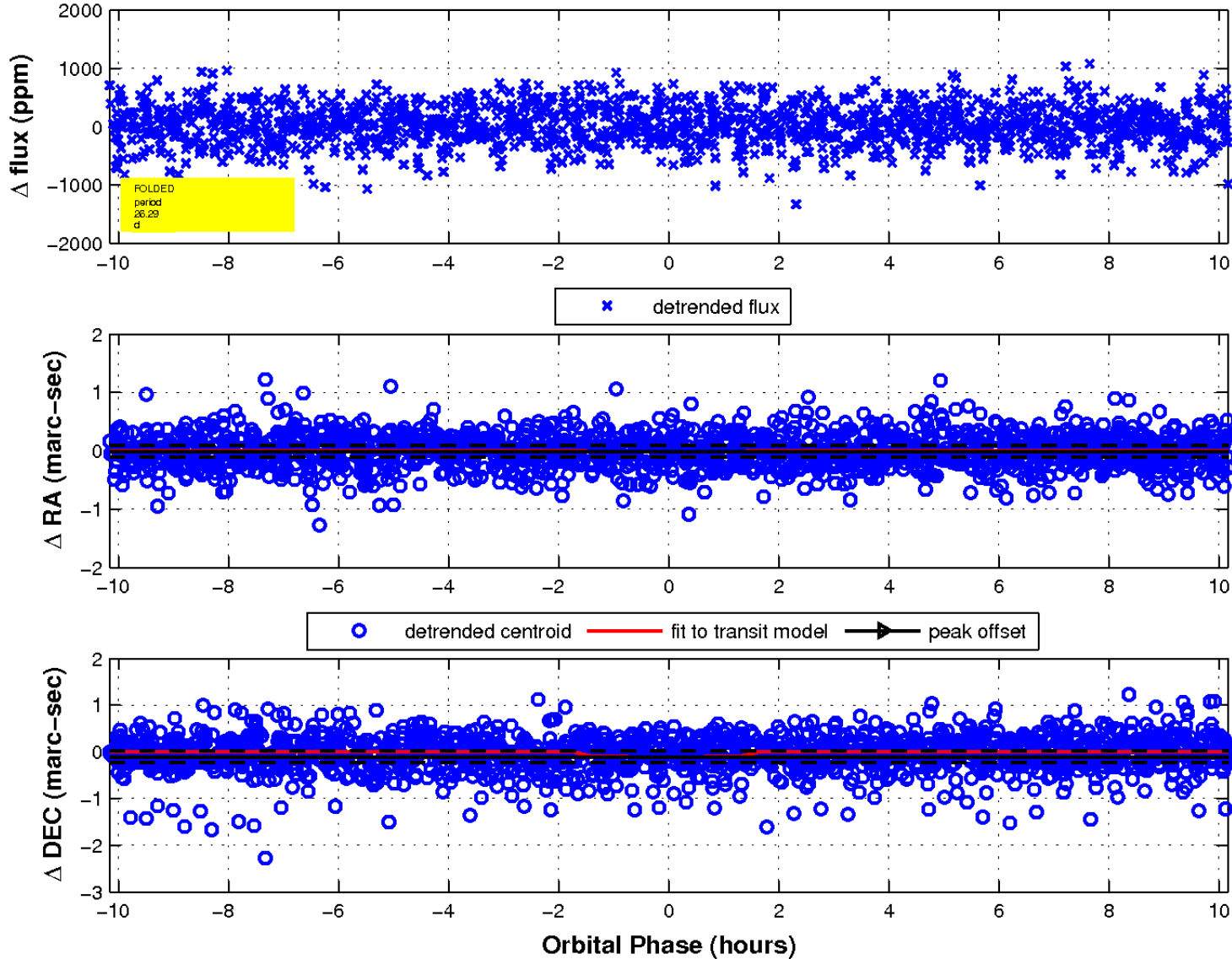
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



fluxWeightedCentroids, Planet 4 of 4



UKIRT Image

Declination

